Future water and sewerage charges 2010-15: Final determinations

Protecting consumers, promoting value, safeguarding the future

PR09

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About this document

This document has four key objectives.

- It describes Ofwat's approach to setting price limits for the water and sewerage companies in England and Wales for the five years 2010-15. It concentrates on where we have developed or adapted the approach we set out in March 2008 in our paper 'Setting price limits for 2010-15 – framework and approach'.

- Along with the company-specific leaflets available on our website, it sets out the price limits for each company for each year of the five-year control period. It also explains the expected changes in bills for each year.

- It summarises the services and outputs that companies will have to deliver to their customers – showing the levels of service they can expect and the bills they will have to pay.

- It explains the reasons for and background to our decisions, including the financial aspects, to enable stakeholders to understand how we have moved to these final price limits from the draft price limits published in July 2009.

Where we refer to bills in this document, we use 2009-10 prices using the basket year (that is, November 2008) RPI. For assumptions on costs and expenditure, we use 2007-08 prices based on the financial year average RPI unless we state otherwise.

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Foreword

This document sets out the decisions of Ofwat (the Water Services Regulation Authority) on price limits for the regulated water companies in England and Wales for 2010 to 2015.

This is the fourth determination of price limits since privatisation 20 years ago. Much has been achieved in those two decades. The UK has shed its reputation as the 'dirty man of Europe'. We have world-class drinking water, fish have returned to the river Thames and we have more than 100 blue flag beaches and marinas in England and Wales.

These improvements are the result of a substantial investment programme. By 2010, the companies will have invested about £85 billion (in today's prices) to maintain and improve assets and services. Our price limits allow for another £22 billion of capital expenditure in the next five years. At 94p a day on average, water bills for most customers represent good value for money.

Our stable, transparent and consistent regulatory framework is a key ingredient in the sector's success. We have built on and improved our process, ensuring we focus on meeting customers' needs and securing the long-term sustainability of the sector. We began our review with the innovative strategic direction statements. These allowed each company to set out for its customers and other stakeholders its goals and aims for the next 25 years. At the same time, companies developed water resource management plans for a similar timeframe. Using these as a backdrop, companies produced detailed business plans for the five years to 2015.

We consulted extensively on draft price limits, listened carefully to representations, took account of the most up-to-date information, and we have made final decisions that are balanced and robust. Our price limits are consistent with the long-term view, take account of customers' views, acknowledge the current difficult economic climate, and enable well-run companies to finance their functions during both good times and bad.

Our decisions mean that average water and sewerage bills will remain at 2009 levels (excluding inflation) over the five-year period. This is significantly lower than in companies' final business plans, which proposed an average increase of about £31. At the same time, the major capital investment programme of more than £22 billion will ensure this crucially important infrastructure will continue to support safe, secure services to customers. It will also continue to address new environmental, security and drinking water standards.

With price limits set for the five years up to 2015, we have an opportunity to review how best to set prices in the future. By 2014, the wider debate on delivering sustainable services, our work in harnessing market forces and possible new legislation may have changed how we think about setting prices. We look forward to continuing to work closely with our stakeholders to deliver a robust regulatory framework for sustainable water and drainage services for the customers of England and Wales.

Regina Finn
Chief Executive

1. Key messages

This document sets out our final determination of price limits for the 10 water and sewerage companies and 12 water only companies in England and Wales for the five years from 1 April 2010. Our price limits will allow each company to fulfil its duties under legislation and its operating licence. We have set price limits that fulfil our statutory duties, take account of guidance from the Secretary of State for the Environment, Food and Rural Affairs and the Welsh Assembly Government, and align with our strategy and vision.

- The price limits we have set increase by an average of 0.5% a year before inflation. They will lead to average household bills falling just below today's levels – by £3 in real terms over the period to 2015. This compares with an increase of £31 that the companies proposed in their business plans – an increase of 9%.

- We have set price limits in accordance with our methodology set out in 'Setting price limits for 2010-15: Framework and approach' (March 2008). Our methodology is tried and tested, and we have continued to use our stable, consistent and transparent approach to regulation.

- We have taken our price review decisions in the same long-term context we asked companies to use for their 25-year strategic direction statements (SDS) and their business plans. We have made a full consideration of companies' business plans and proposals; to these we applied a rigorous and consistent challenge to all business areas and all companies.

- Price limits allow for a capital investment programme of more than £22 billion – this is a significant programme and is higher than any previous five-year period. We have included nearly all the statutory proposals to improve the environment and water quality, including more than 99% of the agreed National Environment Programme (NEP). Where there was not a statutory basis, we took account of the views that customers had expressed in response to our extensive customer research.

- At the beginning of the price review, we said that we would put customers at the heart of the process. At the time, we could not have anticipated the seismic change in the economic and financial environment. Even so, our rigorous approach to setting price limits means that customers can be sure that the significant investment programmes to increase levels of water metering, reduce flooding from sewers, and improve the resilience of key company assets, offer real and lasting value.

- We expect all companies to become more efficient and have challenged proposals for investment based on their scope and costs. Our approach provides incentives for strong well-managed companies to outperform.

- We have listened to what stakeholders told us about our draft determinations. We have included additional risk mitigating mechanisms for bad debt and Environment Agency charges; we have updated our operating expenditure assumptions using improved information on business rates, energy costs and pensions, and we have taken account of new information on the impact of the economy on the industrial demand for water. In addition, we have reviewed our capital investment decisions in the light of better information from companies. This has resulted in greater capital expenditure (by about £1.3 billion), which will deliver more improvements for customers.

- A key aspect of our work is a careful analysis and understanding of the business risks that the companies face. We are clear that this is a relatively low-risk industry – as it should be as the provider of two of the most essential of public services. In this price review process, we do not seek to increase the risks that the companies carry – but we do want to make sure that customers share in the low-risk characteristics wherever possible. This means making financial assumptions that fully reflect the nature of the business and the role of the regulator.

- We have allowed a real cost of capital of 4.5% post-tax. This is unchanged from our draft determinations. This allows a cost of equity of 7.1% and takes account of higher future costs of debt while recognising the low costs of debt that the companies secured before the decline in financial markets.

- We have targeted financial ratios that are consistent with an A-/A3 credit rating. The majority of companies are in this position. Where one particular indicator (and in a small number of cases, two indicators) for a single rating agency may not meet the required threshold, we ensure that it meets the criteria for a strong BBB+/Baa1 credit rating.

Figure 1 What the companies are investing in

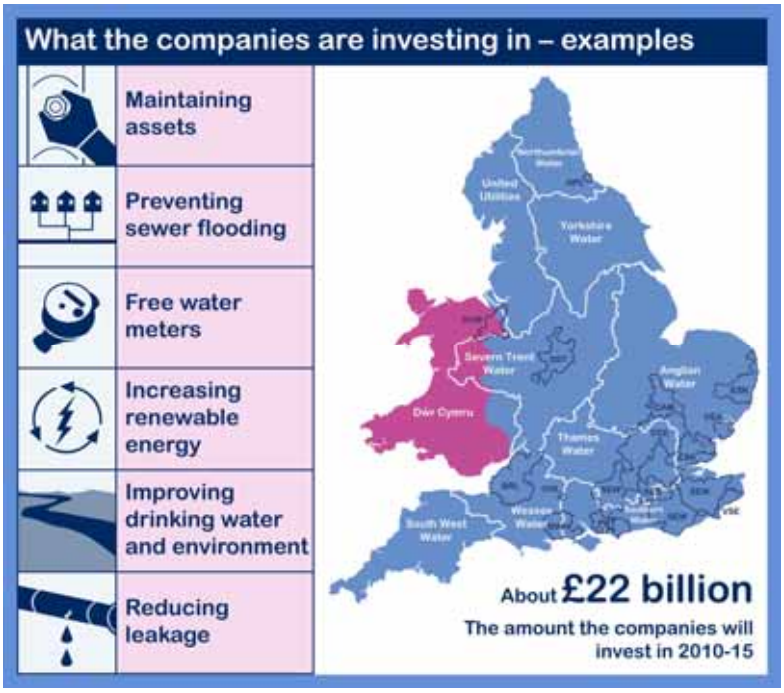


Figure 2 How the money will be invested over 2010-15

This document explains in more detail how we have achieved these things.

1.1 Our duties

We have taken our decisions on price limits in accordance with our statutory duties. We consider that our approach to setting price limits:

- protects the interests of consumers;
- secures that the companies to which the price limits apply are able to finance the proper carrying out of their functions;
- promotes economy and efficiency on the part of those companies; and
- contributes to the achievement of sustainable development.

We have reached our decisions on price limits having considered the final business plan submitted by each company and their representations on our draft price limits. We have considered the representations of customers, including those presented on their behalf by the Consumer Council for Water (CCWater), on our draft determinations.

We have taken account of the strategic policy statements on water for both England and Wales and made decisions that are consistent with social and environmental guidance issued by the Secretary of State for the Environment, Food and Rural Affairs and the Welsh Assembly Government. Our price limits take account of the formal guidance issued by Secretary of State for the Environment, Food and Rural Affairs and the Welsh Assembly Government. We have also taken advice from the quality regulators – the Drinking Water Inspectorate (DWI) and the Environment Agency, working where appropriate with Natural England and the Countryside Council for Wales.

We have also had regard to the principles of best regulatory practice throughout the decision-making process and will continue to do so. We have paid particular regard to the principles under which regulatory activities should be transparent, accountable, proportionate, consistent, and targeted only at cases that need action.

1.2 Drivers of change in the average household bill

At the industry level, our price limit decisions would lead to average bills (before inflation) which end the five-year period slightly below (by £3) today's levels. Table 1 shows what is driving the change in bills and how the key expenditure components contribute to the reduction.

Table 1 What is driving the changes in bills?

(in 2009-10 prices)	Total (£)	(£)
Average bill in 2009-10	**343**	
(1) past efficiency savings and outperformance	**2**	
(2) maintaining base services	**(26)**	
Of which: a) changes in revenue		(14)
b) changes in operating costs		7
c) changes in capital maintenance		1
d) changes in impact of taxation		(7)
e) changes in the cost of capital		(13)
(3) maintaining and enhancing security of supplies to all consumers	**9**	
(4) the impact of improvements in services	**21**	
Of which: a) drinking water quality		4
b) environmental improvements		15
c) improvements in service performance		2
(5) scope for reduction through future efficiency improvements	**(9)**	
Average bill at 2014-15	**340**	
Change from end of the last period	**(3)**	

The table shows that behind the small decrease in bills there are notable upward pressures. Most of these relate to the need for the companies:

- to invest to improve services to customers and improve the environment;
- to pay higher operating costs, including increased business rates and energy costs; and
- meet pension liabilities.

However, the assumptions we have made on the cost of capital, future efficiency and revenues, when combined with the lower impact of taxation, lead to an overall decrease in average bills, in real terms (before adjustment for inflation) of £3. We will provide further detail on each of these drivers of change in bills in the following chapters of this document.

Of course, the factors driving the changes in bills are different for each company. We have included a similar table for each company in the 2009 price review (PR09) determinations section of our website.

1.3 Comparing final determinations to final business plans

Companies' final business plans would have added £31 to bills – an increase of 9%. Table 2 compares our price limits with those that the companies proposed in their final business plans. The table shows that our price limits are lower than those that the companies proposed by an average of 2% a year.

Table 2 Business plan and final determination price limits (industry level)

Price limits	2010-11	2011-12	2012-13	2013-14	2014-15	Average
Water and sewerage companies (weighted average)						
Business plans	5.1	2.2	2.5	1.4	0.7	2.4
Final determinations	-0.8	0.2	1.7	0.7	0.5	0.5
Water only companies (weighted average)						
Business plans	12.1	3.1	2.4	1.3	0.7	3.8
Final determinations	1.6	1.6	0.3	-1.1	-0.8	0.3
Industry (weighted average)						
Business plans	5.6	2.3	2.5	1.4	0.7	2.5
Final determinations	-0.6	0.3	1.6	0.6	0.4	0.5

1.4 Representations on the draft determinations

In 'Future water and sewerage charges 2010-15: draft determinations' (July 2009), we sought representations from the companies, customers, the Consumer Council for Water (CCWater) and other stakeholders on our draft price limits.

Throughout the price review process, we have worked closely with key stakeholders including DEFRA and the Welsh Assembly Government. In addition, in Wales we have joined the PR09 forum for Wales. This allowed us to understand the particular price review issues in Wales; members of the forum also provided representations on our draft determinations.

We received more than 50 representations (in addition to 450 concerning a sewer flooding issue in Alcester, Worcestershire) from a wide range of stakeholders in addition to the water and sewerage companies and the quality regulators. Each of the CCWater committees provided a response (which they have published on their website) as did groups that represented particular interests, for example the Royal Society for the Protection of Birds (RSPB), Water UK and the Society of British Water and Wastewater Industries. Individual customers responded, mostly focusing on local issues; and a number of elected representatives contacted us. We include a list of the respondents to our draft determinations in appendix 1.

Each company provided full and detailed written representations on its draft determination. In some areas, they considered that we had not treated company-specific issues correctly; in others, they suggested that we had made errors. They also challenged aspects of our approach, questioning the scope of some of the assumptions underlying our draft determinations.

In addition to considering representations, we have dealt with specific queries from the companies arising from the detailed information we provided to them with their draft determinations. We received more than 500 questions. We also met each company to hear its material concerns.

As well as receiving written representations from each CCWater regional committee on our draft determinations, we met representatives from each committee. At these meetings, the CCWater members set out their views on the draft determinations and on the areas where they thought we should revise our approach. They also sought further explanation on some of our decisions. The CCWater committees play an important part in helping us to understand customers' concerns.

As part of our accountability to Parliament, we also contributed evidence to the Environment, Food and Rural Affairs Committee's investigation into the price review. We have responded to its report and recommendations.

1.4.1 Representations from CCWater and customers

CCWater generally welcomed our draft determinations. They carried out customer research to understand customers' views on the draft determinations and found that more than 80% of respondents considered the proposals were acceptable. In their meetings with us, the regional committees concentrated on a small number of discrete areas, with some stronger representations on company specific issues.

The main cross-cutting issues that CCWater raised included:

- the need for further improvements for customers in specific areas, including reductions in sewer flooding and improved drinking water aesthetics;
- a reduction in their perception of the risk of asset failure in the future;
- better protection against higher bills for customers who were transferred to a metered supply;
- the view that the cost of capital was set too high at draft determinations; and
- smoothing bills to counteract the effect of inflation.

Despite these concerns, CCWater did not want to see bills much higher than those in our draft determinations.

We were pleased that the CCWater research showed that customers supported our draft determinations. While price limits are slightly higher, the increase secures more outputs,

improved service and lower risk for customers. We have taken steps to improve the outputs that matter most to customers (in particular more sewer flooding reductions and improved water taste and odour) and to improve the associated incentives that will reduce the risk of failures in the future. We will work with CCWater and companies on the issues arising from compulsory metering.

We explain our view on the cost of capital in chapter 5 of this document.

We have looked at smoothing bills for inflation. We conclude that the resulting increases in the total amount paid by customers were not consistent with CCWater's wish for customers to pay any more than was necessary.

1.4.2 Issues raised by companies in representations

The companies used their representations to highlight aspects of our draft determinations that they wanted changed. Generally, but not exclusively, they did not comment on aspects they found acceptable. The responses from companies, in most cases, expressed concerns with our draft determinations (as they have at this stage of previous price reviews). They argued that our decisions resulted in an unacceptable package. However, not all companies were equally critical. Some acknowledged:

- the improved structure of the price review (including the SDS phase and the draft CIS baseline);
- the benefits accruing from incentive schemes set up at previous price reviews; and
- our willingness to engage on matters of detail affecting price limits.

Even so, overall the companies expressed negative sentiments about the following issues of concern raised in many representations.

- Aspects of Ofwat' use of the capital expenditure incentive scheme (CIS).
- Levels of capital maintenance.
- Assumptions on future efficiency.
- Allowances for 'known' future operating costs
- Lack of incentives and rewards for outperformance.
- Increases in the operating and financial risk carried by the companies.
- The need to increase price limits to cover the full costs of pension deficits.
- Financing assumptions.
- Assumptions on capital structure.

We discuss the representations on CIS and levels of capital maintenance expenditure in sections 4.2 and 4.3. Operating expenditure, including pensions costs are discussed in section 4.9; financing issues are set out in chapter 5.

The company representations included a general theme that the draft determinations would not leave them in a financially viable position. They cited the following general reasons.

- The balance of risk has shifted from customers to companies (effectively shareholders) without commensurate increased reward (discussed in sections 5.3-5.6).

- Tough efficiency challenges and lack of recognition of known operating cost increases have reduced the opportunity (and incentive) to outperform, thus reducing the attractiveness of the sectors to equity. Smaller companies argued that this had a significant impact on them (discussed in sections 4.9, 4.10 and 5.5).

- The draft determination CIS ratios (with all companies above 100) created a "penalty" that means that even efficient companies cannot achieve a reasonable overall rate of return (discussed in sections 4.2 and 5.9).

- Greater headroom was required against the benchmark financial indicators to take account of the current economic climate including the prospect of an extended period of deflation (discussed in sections 5.3-5.6).

- More notified items were needed to mitigate the risk associated with a range of issues including bad debt, energy and tax (discussed in sections 4.9 and 5.3).

Other finance related issues that more than one company raised included:

- a view that our cost of debt and equity assumptions were too low;
- a suggestion that our financeability test should be made after all cash flows rather than before taking account of incentive mechanisms;
- it was unrealistic to assume equity injections would resolve financeability; and
- a claim for a small company premium on the cost of capital for the water only companies.

We discussed these concerns with each company in our strategic meetings with them. These meetings also raised two general (but far from universal) issues of perception and communication arising from our draft determinations.

- Companies suggested that we had started the decision-making phase of the price review with a presumed outcome of decreasing price limits. This is clearly not the case – while the average price limits and bills remain close to zero, there is clear variation around this from company to company. Of course, we did have certain presumptions – that we would put customers at the heart of the price review (recognising the current economic circumstances), and that we would set price limits which allowed efficient companies to deliver the outputs relating to

statutory programmes of improvement. The resulting price limits achieve these aims.

- Companies were concerned that we had not had sufficient regard to the long term, in particular, that we had not taken enough account of the strategies set out in the 25-year SDS. We believe that for each company there are clear links between the SDS, the long term and our price limits. This is largely because the innovative SDS began a process by which companies could bring long-term issues into their business plans, allowing us to make decisions that address these. Accordingly, we have supported programmes of water resource development that will address longer-term issues, and our decisions relating to catchment management, renewable energy and resilience are focused clearly on the longer term.

Operating expenditure issues

In general, companies argued that the operating expenditure assumptions were insufficient and this contributed to financing concerns summarised above. The main issues of concern were that:

- the operating expenditure efficiency targets were too tough and not achievable (including the continuing efficiency target);
- we have not given specific uplifts for “known” operating cost increases; and
- there were insufficient notified items to address operating expenditure uncertainties.

Specific areas of concern included (but were not limited to):

- pensions;
- energy;
- bad debt;
- business rates; and
- Environment Agency charges.

We had already signalled that we expected to consider the overall operating expenditure based on the most up-to-date information. We expected to use the data provided in the June return to reassess relative efficiency, and we anticipated the need to make changes to business rates. Our final determinations include these changes, as well as new positions on pensions, power and notified items. We discuss these issues in section 4.9.

Capital expenditure

Issues raised on capital expenditure were generally quite company specific. However, generic issues included:

- where companies agreed with the principles of CIS but frequently did not like the outcome for their particular company;
- the use and application of our cost base tool, particularly for those companies where it led to high efficiency challenges;
- the asset management assessment (AMA) challenge for capital maintenance where there was general concern about how companies' proposals had been scored and a view that we had taken an "arbitrary" approach to challenge; and
- a concern that the new approach to capital maintenance increased the risk to services in the future.

We explain our position on these matters in sections 4.2-4.8 for expenditure and 4.10 on capital efficiency.

The key specific capital expenditure issues where there were concerns across more than one company included:

- expenditure on sewer flooding;
- allocation of expenditure to meet DWI requirements to capital maintenance;
- assumptions on metering costs;
- investment to reduce leakage and our approach to accounting for this; and
- our approach to expenditure proposals for investment to improve resilience.

These issues are addressed in sections 4.2-4.8 of this document.

We have reconsidered our position on each of these issues. In some cases, using new information provided to us, we have reached revised positions. Price limits include additional sewer flooding outputs and make provision for slightly more meters. We have worked with the DWI to improve the confidence in our approach to drinking water quality investment.

There were also various company-specific representations; we have addressed these in our company-specific documentation.

1.4.3 Issues raised by other regulators and NGOs

In general, other stakeholders welcomed our draft determinations. There were some concerns including:

- a desire to see more investment to reduce leakage and improve water efficiency (particularly through increased metering); and
- a concern that our approach to capital maintenance may increase the risk to the environment and public health in the future.

Our final determinations include more metering programmes and continue to support improvements in leakage and water efficiency.

1.4.4 Issues raised by the financial sector

The companies referred to the position of equity investors, and many cited the updated Water UK investor survey carried out after our draft determinations. We have held meetings directly with equity investors and some have sent in written submissions. These echoed the companies' submissions. They claimed that equity investors now carried too much risk, and that the ability to outperform was limited and did not provide sufficient reward. Investors pointed to the relatively poor performance of share prices immediately following our draft determinations. Debt investors appear more sanguine.

In our making our final determinations, we have considered the risk balance again. We have taken steps to improve the balance of risks that we think investors will value. This is set out in sections 5.3 to 5.6.

The credit rating agencies also published their views on our draft determinations. While Standard & Poors placed three companies publicly on 'credit watch', Moody's and Fitch had a stable outlook but noted the significantly reduced headroom in companies' financial projections. Moody's raised some concerns on aspects of the CIS process. We believe that the new CIS ratios – much reduced for our final determinations, addresses most of these concerns.

1.4.5 Issues raised by MPs and local government

We received some representations, most of which were generated in response to Thames' briefings on our draft determinations. Many of these representations concerned our approach to sewer flooding in one part of London. We explain our action to deal with this concern in section 3.2.2. One MP suggested that we were failing in our wider environmental duties by not requiring generally larger reductions in leakage and not requiring all companies to become even more water efficient. We set out our approach to leakage and water efficiency in chapters 3 and 4. Our decisions take account of the information provided to us by companies and regulators and are consistent with the current view of the longer term. However, our approach is flexible and we have put in place a notified item, which will support companies as they move to address water resource issues relating to climate change.

We received a few responses from local government concerning company-specific issues. We have addressed most of their concerns.

1.5 Next steps

Companies must now consider our final determinations. Each company has two choices.

- If a company disputes our final determination, it can require us to refer it to the Competition Commission to determine the price limits under dispute (it must exercise this right within two months of the final determination).

- If it accepts our price limits, it must work to deliver the outputs specified in the company-specific documentation.

If a company requires a reference to the Competition Commission, then it will base its bills for the first year of the period on our price limits. If the Competition Commission considers it appropriate to change the determination, adjustments are made to the company's price limits in subsequent years to accommodate those changes.

2. Price limits and bills

Our price limits for each company cover the five years from 1 April 2010 to 31 March 2015. However, our decisions are consistent with the longer time frame captured in each company's strategic direction statement and in other framework documents relating to water resources and housing growth. Our decisions also support actions to adapt to climate change and to mitigate the impact of the companies' activities on the environment now and in the future.

This chapter sets out the price limits for each company and the average bills that could result. We have also included a breakdown, at an industry level, of the expenditure in each of the key investment categories.

2.1 Price limits

Table 3 shows the price limit for each company for each year of the price review period and the average figure for each company for the five years. It also shows the annual average and five-year average for the industry as a whole. Over the five-year period at the industry level, these determinations increase price limits by an average of 0.5% a year.

Table 3 Price limits for 2010-11 to 2014-15

	Annual price limits					
	2010-11	2011-12	2012-13	2013-14	2014-15	Average[1]
Water and sewerage companies (WaSC)						
Anglian	-0.7	0.0	1.4	1.1	0.9	0.5
Dŵr Cymru	-1.3	-1.3	-0.4	-0.4	-0.6	-0.8
Northumbrian	5.0	3.8	0.9	0.0	-1.0	1.7
Severn Trent	-1.0	0.0	0.0	-1.0	-1.1	-0.6
South West	1.1	3.4	2.5	1.3	1.1	1.9
Southern	-0.7	0.0	3.6	3.3	-0.1	1.2
Thames	0.2	0.4	4.6	0.4	1.4	1.4
United Utilities	-4.3	-0.2	0.6	1.0	1.2	-0.4
Wessex	0.3	0.3	1.9	1.9	1.5	1.2
Yorkshire	-1.2	-1.3	1.4	1.8	1.6	0.5
WaSC average (weighted)	**-0.8**	**0.2**	**1.7**	**0.7**	**0.5**	**0.5**
Water only companies (WoC)						
Bournemouth & W Hampshire	4.0	2.1	-0.5	-0.8	0.2	1.0
Bristol	0.6	4.2	4.0	0.3	-0.2	1.8
Cambridge	-1.0	-1.0	0.9	0.2	-0.6	-0.3
Cholderton[2]	2.4	-1.0	-1.6	0.8	-0.7	0.0
Dee Valley	0.6	0.6	0.6	1.0	-0.5	0.5
Portsmouth	-4.8	-2.1	-1.7	-1.4	-0.6	-2.1
South East	4.4	3.9	1.7	-1.4	0.6	1.8
South Staffs	1.5	0.0	1.9	0.0	-0.6	0.6
Sutton & East Surrey	0.0	0.0	2.0	1.4	-1.2	0.4
Veolia Central	1.4	0.8	-2.8	-2.8	-2.3	-1.2
Veolia East	-1.6	-1.4	-0.7	-0.7	-0.9	-1.1
Veolia Southeast	1.2	1.2	1.6	1.6	-0.9	0.9
WoC average (weighted)	**1.6**	**1.6**	**0.3**	**-1.1**	**-0.8**	**0.3**
Industry average (weighted)	**-0.6**	**0.3**	**1.6**	**0.6**	**0.4**	**0.5**

Notes:

1. The average for the price limits is the geometric average of the annual price limits.
2. Cholderton is a very small company. We have set price limits, but other than in this table and tables 4 and 5. Cholderton is not included in tables in the remainder of this document. It does not have a material effect on the industry averages.

While the average increase in price limits is 0.5% a year, there are variations at the company level. The five-year average change varies from -2.1% (Portsmouth) to +1.9% (South West). In general, the water only companies show smaller average increases in price limits (average 0.3% a year) mostly reflecting their relatively small capital programme and the reduction in the small company premium on the cost of capital (see section 5.5).

Table 4 compares our final price limits with those that the companies proposed in their final business plans. The table shows our final price limits are lower by 2.0% a year. The largest difference is for Sutton & East Surrey at 5.0% a year and the smallest is for Yorkshire and Wessex – both at 1.2% a year.

Table 4 Comparison of price limits with final business plan proposals

Annual average price limits			
	Final business plan average K	Final determination average K	Difference between final business plan and final determination
Water and sewerage companies			
Anglian	2.7	0.5	-2.2
Dŵr Cymru	0.7	-0.8	-1.5
Northumbrian	3.3	1.7	-1.6
Severn Trent	1.1	-0.6	-1.7
South West	3.4	1.9	-1.5
Southern	2.9	1.2	-1.7
Thames	3.9	1.4	-2.5
United Utilities	1.8	-0.4	-2.2
Wessex	2.4	1.2	-1.2
Yorkshire	1.7	0.5	-1.2
WaSC average	**2.4**	**0.5**	**-1.9**
Water only companies			
Bournemouth & W Hampshire	4.4	1.0	-3.4
Bristol	5.7	1.8	-3.9
Cambridge	1.7	-0.3	-2.0
Cholderton	2.4	0.0	-2.4
Dee Valley	1.9	0.5	-2.4
Portsmouth	2.4	-2.1	-4.5
South East	5.7	1.8	-3.9
South Staffs	3.4	0.6	-2.8
Sutton & East Surrey	5.4	0.4	-5.0
Veolia Central	1.9	-1.2	-3.1
Veolia East	2.9	-1.1	-4.0
Veolia Southeast	5.1	0.9	-4.2
WoC average	**3.8**	**0.3**	**-3.5**
Industry average	**2.5**	**0.5**	**-2.0**

Table 5 shows the change in price limits between our draft and final determinations. The industry average price limit has increased by 0.7% a year between our draft and final price limits. The increases for water only companies are much larger (1.4% a year) than for water and sewerage companies (0.6% a year). The greatest changes are for Bristol (2.1% a year) and Sutton & East Surrey (1.9% a year). The smallest change is for Bournemouth & West Hampshire at just 0.1% a year.

Table 5 Price limit changes from draft to final determinations

Annual average price limits			
	Draft determination average K	Final determinations average K	Difference between draft and final determination
Water and sewerage companies			
Anglian	0.2	0.5	0.3
Dŵr Cymru	-1.1	-0.8	0.3
Northumbrian	0.9	1.7	0.8
Severn Trent	-1.5	-0.6	0.9
South West	0.9	1.9	1.0
Southern	0.0	1.2	1.2
Thames	0.8	1.4	0.6
United Utilities	-0.6	-0.4	0.3
Wessex	0.1	1.2	1.1
Yorkshire	0.1	0.5	0.4
WaSC average	**-0.1**	**0.5**	**0.6**
Water only companies			
Bournemouth & W Hampshire	0.9	1.0	0.1
Bristol	-0.4	1.8	2.1
Cambridge	-1.9	-0.3	1.6
Cholderton	-1.6	0.0	1.6
Dee Valley	-0.4	0.5	0.9
Portsmouth	-3.4	-2.1	1.3
South East	0.0	1.8	1.9
South Staffs	-0.3	0.6	0.9
Sutton & East Surrey	-1.5	0.4	1.9
Veolia Central	-2.4	-1.2	1.2
Veolia East	-2.5	-1.1	1.4
Veolia Southeast	-0.4	0.9	1.3
WoC average	**-1.1**	**0.3**	**1.4**
Industry average	**-0.2**	**0.5**	**0.7**

The changes from our draft determinations relate to a number of factors.

- Higher levels of capital expenditure for some companies to deliver additional outputs (such as metering and sewer flooding).
- Additional schemes in the NEP.
- Increased expenditure on capital maintenance to ensure network serviceability is maintained.
- New information on external factors (such as the industrial demand for water, energy, business rates, and pension liabilities).
- Ensuring that there remain strong incentives to efficiency, which is rewarded appropriately, particularly in respect of CIS.

- A planned reassessment of relative efficiency for operating expenditure using the information in the 2009 June return.
- Clarification of company-specific issues.
- A reassessment of the balance of risk in light of new information and representations. We have included two further notified items: the first on bad debt, and the second on certain Environment Agency abstraction charges.

Individually, these had a small impact on the price limits. However, when taken together they increase average annual price limits from -0.2% to +0.5%. They have also had a more material affect for some companies as table 5 shows.

In total, the changes from draft determinations have increased the capital expenditure by £1.3 billion to £22.1 billion, compared with £24.2 billion in the final business plans. The average operating expenditure allowance has increase by £0.1 billion a year to £3.7 billion a year (£3.8 billion in the final business plans).

2.1.1 Making decisions on price limits

At each price review, we consider companies' proposals for price limits for the following five years. However, we also look for plans that are not unnecessarily constrained by the five-year period and are consistent with a longer-term view, and which offer best value for customers. For this price review, we expected the companies to set their five-year plans in the context of both their 25-year SDS and the statutorily based water resource management plans.

We looked for business plans that took a realistic and pragmatic view of the risks facing them and of the potential for becoming more efficient in the future. At the same time, companies had to put forward investment proposals that would satisfy new statutory requirements and deal with issues of concern to customers.

We have a duty to finance the functions of efficient companies. The price limits we have set allow each company to earn a return on their capital base and enable them to raise finance on reasonable terms. We believe the price limits will help an efficient company to deliver the right outcomes at the right time, and represent value for money for customers. We do not have a duty to support poorly run companies.

One of the most difficult issues for us as we set price limits, given the current economic and financial environment, is how to deal with uncertainty. Our preferred approach is to work to reduce uncertainty, making robust decisions on costs and outputs that we can include in price limits. In this way, customers can have confidence about future bills and investors can have a clearer view of the risks they may face. However, this is not always possible and, over time, we have developed mechanisms to address changes that would have a material impact on the ability of a company to finance its functions. We describe these and summarise our approach for this price review in section 5.3.

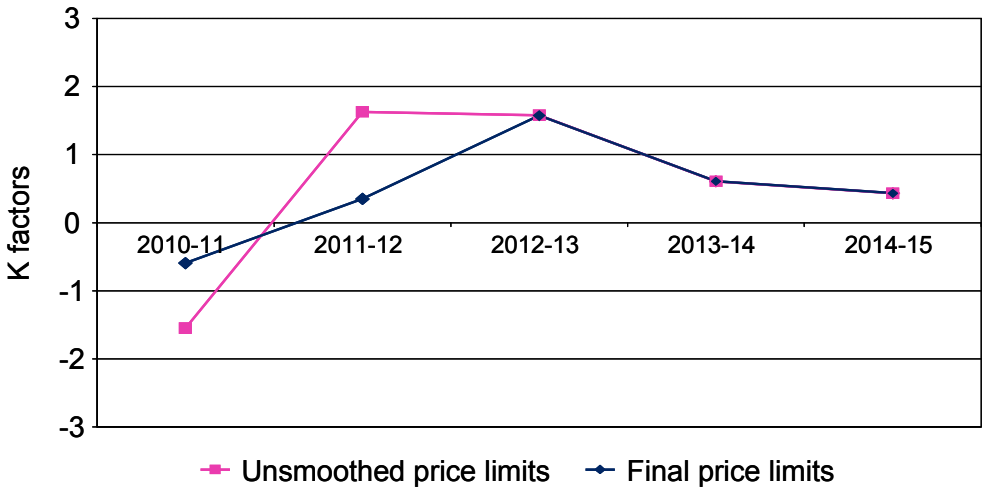
It is in customers' interests that price limits should only take account of investment proposals where there is reasonable certainty. Accordingly, our price limits do not take account of the adoption of private sewers, even though Government has promised legislation to bring about change in this area. Neither do price limits take account of the issues arising from the recently published UK Climate Impacts Programme (UKCIP) climate change scenarios. However, in both cases our overall approach will allow companies to take prompt action before the next price review when the implications of the new information become clear enough to support additional expenditure.

2.1.2 The profile of price limits

For all but three of the water and sewerage companies (Northumbrian, South West and United Utilities) and for four water only companies (Cambridge, Dee Valley, Sutton & East Surrey and Veolia Southeast) we have smoothed the early price limits (K factors). We have taken this step because we found some significant volatility between the first year, 2010-11 (which showed negative price limits), and 2011-12 (where price limits were mostly positive). These variations occur simply because the raw price limits reflect exactly the actual cost and expenditure assumptions for each year. There were many decreasing factors in the first year followed by high levels of investment in the next year.

This profile will also be exacerbated by the unusual trend in inflation where we anticipate deflation (negative RPI) in 2009, which flows through to customers' bills for 2010-11, followed by a return to positive inflation beyond (see section 5.11). Customers have frequently told us that they prefer bills that are as stable as possible (see chapter 3 on customer preferences). So, we have taken steps to smooth out these differences to provide a more even price limit profile. This has no impact on the overall bill to customers by 2015 or on the financial return to the companies concerned over the five-year period.

Figure 3 Industry price limits – smoothed and unsmoothed profiles



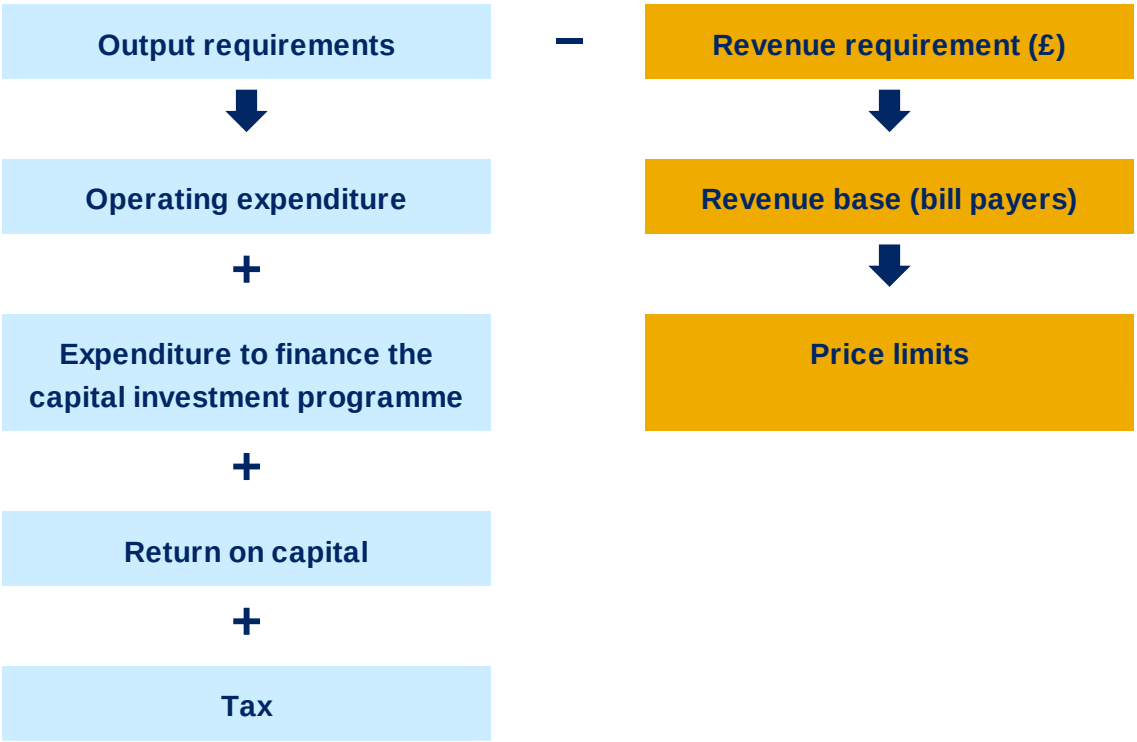
As part of its representations, CCWater asked us to take action to smooth price limits across the whole of the period for all companies, including countering the likely impact of inflation. We did not do this for three reasons.

- We believe that the profile of price limits (and bills) should follow the underlying profile of the change in costs.
- The pattern of inflation is expected to be unusual only in the first few years.
- Bills may end up higher at the end of the period if smoothed.

2.1.3 Approach to setting price limits

Figure 2 below shows how we follow a relatively simple approach to setting price limits. Essentially, we determine the level of revenue needed to deliver our view of each company's business plan. We then apply adjustments for performance related rewards or penalties. This figure becomes the 'revenue requirement'. We compare this to the forecast revenue and express the difference as a price limit. The annual price limit is the maximum by which a company can increase its overall prices in a particular year.

Figure 4 Approach to setting price limits



2.1.4 Price limits by service

Because the companies are managed as single units, at least at the strategic level, we do not set separate price limits for water and sewerage services. However, to allow the

customers of the water only companies to make comparisons, we have apportioned price limits between the water and sewerage services as shown in table 6.

Table 6 Indicative changes in water and sewerage charges 2010-11 to 2014-15

	Price limit for first year 2010-11 (%)			Cumulative price limits for four years 2011-12 to 2014-15 (%)		
		Indicative			Indicative	
	Price limit	Water	Sewerage	Price limit	Water	Sewerage
Water and sewerage companies						
Anglian	-0.7	-1.5	-0.3	3.4	5.7	1.9
Dŵr Cymru	-1.3	-3.5	0.4	-2.7	-2.8	-2.7
Northumbrian	5.0	7.9	1.1	3.7	5.6	1.3
Severn Trent	-1.0	4.1	-5.5	-2.1	-3.6	-0.7
South West	1.1	1.0	1.0	8.5	7.7	9.4
Southern	-0.7	1.6	-1.5	6.9	4.2	7.8
Thames	0.2	3.7	-3.5	6.9	-1.9	16.6
United Utilities	-4.3	1.7	-8.8	2.6	0.9	4.2
Wessex	0.3	4.5	-2.0	5.7	13.4	1.7
Yorkshire	-1.2	-2.5	-0.1	3.5	0.9	5.8
WaSC average (weighted)	**-0.8**	**1.9**	**-3.0**	**3.2**	**1.2**	**5.0**
WoC average (weighted)	**1.6**	**1.6**		**0.0**	**0.0**	
Industry average (weighted)	**-0.6**	**1.8**	**-3.0**	**3.0**	**1.0**	**5.0**

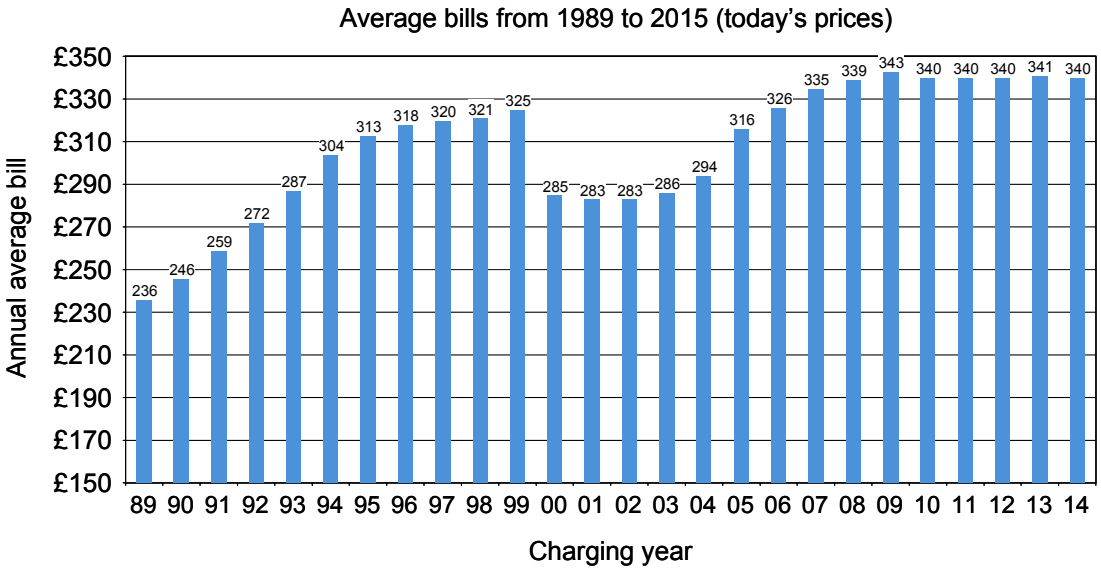
The sewerage service price limits for each company are generally lower than for the water service in the first year. We have set out the reasons for this in chapters 4 and 5 on our cost and financial assumptions.

2.2 Bills to customers

Price limits are not the same as bills to customers. The latter reflect the actual nature of a company's customer base, in particular the proportion of water supplied to household and non-household customers. They also reflect the proportion of household customers who have a metered water supply.

Figure 3 shows how average (that is, combined metered and unmetered household) bills have changed since privatisation. It shows that bills on average are broadly stable over the next five years, subject to inflation. However, individual bills will vary considerably between companies according to whether the customer has a meter.

Figure 5 Average bills since privatisation



2.2.1 Average household bills

Table 7 shows the impact of our final determinations on the average bills of customers of each company. It shows that there is no change (at £162) in the average bill for water over the period, and a reduction of £3 from £181 to £178 for sewerage.

For the water service, Portsmouth has the lowest average household bill in 2014-15 at £87, while Wessex has the highest at £224. For the sewerage service, South West has the highest average bill at £278, with Thames the lowest at £133.

Table 7 Expected average household bills[1]

	Average annual household bills (£)[2]							
	2009-10		2014-15		Change			
	Water	Sewerage	Water	Sewerage	Water	Sewerage	Total	%
Water and sewerage companies								
Anglian	172	216	159	202	-13	-15	-28	-7
Anglian Water[3]	173	216	160	202	-13	-15	-28	-7
Hartlepool Water	127		126		-1		-1	-1
Dŵr Cymru	171	233	155	219	-16	-13	-29	-7
Northumbrian[3]	147	167	163	168	16	1	17	6
Northumbrian area	131	167	144	168	13	1	14	5
Essex & Suffolk area	169		190		21	0	21	13
Severn Trent	152	152	151	140	-1	-12	-13	-4
South West	207	283	205	278	-1	-5	-6	-1
Southern	127	246	138	255	11	9	20	5
Thames	183	121	180	133	-2	12	10	3
United Utilities	169	205	172	192	3	-12	-9	-3
Wessex	202	210	224	200	22	-10	12	3
Yorkshire	154	178	149	183	-4	6	1	0
WaSC average (weighted)	**165**	**181**	**165**	**178**	**0**	**-2**	**-3**	**-1**
Water only companies								
Bournemouth & W Hampshire	133		134		1		1	1
Bristol	157		168		11		11	7
Cambridge	114		116		2		2	1
Cholderton	188		188		0		0	0
Dee Valley	128		130		2		2	2
Portsmouth	93		87		-6		-6	-7
South East	169		174		5		5	3
South Staffs	124		126		2		2	2
Sutton & East Surrey	166		167		1		1	1
Veolia Central	156		146		-10		-10	-6
Veolia East	169		160		-10		-10	-6
Veolia Southeast	185		181		-4		-4	-2
WoC average (weighted)	**148**		**148**		**-1**		**-1**	**-1**
Industry average (weighted)	**162**	**181**	**162**	**178**	**0**	**-2**	**-3**	**-1**

Notes:

1. This table is quoted in 2009-10 basket year prices.
2. The actual impact on customers' household bills will also be governed by companies' approved charges schemes.
3. We set a single price limit for Anglian and Northumbrian. The bills set out for all the regions (that is, including Hartlepool and Essex & Suffolk) for water are consistent with the overall price limit and assume an equal application of K in each sub-area, but the companies may apply the price limit differentially to reflect differences in cost drivers.

The largest increases in bills over the period are at Wessex (£22) for the water service and Thames (£12) for the sewerage service. The largest fall in bills for water is £16 (Dŵr Cymru) and for sewerage £15 (Anglian).

These compare with the companies' proposals set out in table 8, which contained proposals averaging bill increases of 9% (£31). However, some customers could have faced even higher bills; for example, those of Sutton & East Surrey (who receive their sewerage service from Thames), would have faced, on average, combined bills that would have increased by £70.

Table 8 Business plan bill proposals

	2009-10		2014-15		Change			
	Water	Sewerage	Water	Sewerage	Water	Sewerage	Total	%
Water and sewerage companies								
Anglian[1]	172	216	183	218	10	1	12	3%
Hartlepool	127		145		18		18	14%
Dŵr Cymru	171	233	168	235	-3	3	0	0%
Northumbrian	147	167	174	183	28	16	43	14%
Northumbrian area	131	167	157	183	26	16	42	14%
Essex and Suffolk area	169		206		38		38	20%
Severn Trent	152	152	169	149	16	-4	13	4%
South West	205	283	215	302	10	19	29	6%
Southern	131	249	152	274	22	25	47	12%
Thames	183	121	210	146	27	25	52	17%
United Utilities	171	206	187	217	16	11	28	7%
Wessex	202	210	211	223	9	13	25	6%
Yorkshire	154	178	160	192	6	15	21	6%
WaSC average	**166**	**181**	**182**	**194**	**16**	**13**	**29**	**8%**
Water only companies								
Bournemouth & W Hampshire	133		158		25		25	19%
Bristol	157		202		46		46	29%
Cambridge	121		129		8		8	7%
Dee Valley	128		140		12		12	9%
Portsmouth	93		105		12		12	13%
South East	169		208		38		38	23%
South Staffs	124		145		21		21	17%
Sutton & East Surrey	165		210		45		45	27%
Veolia Central	160		174		13		13	8%
Veolia East	175		199		25		25	14%
Veolia Southeast	197		226		31		29	16%
WoC average	**150**		**176**		**25**		**25**	**17%**
Industry average	**163**	**181**	**181**	**194**	**18**	**13**	**31**	**9%**

Note:

1. We did not require Anglian to provide a bill for the Anglian area only as part of its business plan submission. This is for the average bill for both regions.

2.2.2 Typical household bills for metered and unmetered customers

Table 9 shows the changes in the typical bill for each company for each category over the period covered by our final determinations.

Table 9 Change in typical metered and unmetered household bills

	Household bills (£)					
	2009-10		2014-15		change	
	Metered	Unmetered	Metered	Unmetered	Metered	Unmetered
Water and sewerage companies						
Anglian	348	470	336	533	-3%	13%
Dŵr Cymru	292	456	276	449	-5%	-2%
Northumbrian	267	335	280	375	5%	12%
Severn Trent	280	316	267	307	-5%	-3%
South West	401	723	407	935	1%	29%
Southern	324	412	352	422	9%	2%
Thames	280	316	292	343	4%	9%
United Utilities	344	398	334	413	-3%	4%
Wessex	358	469	369	565	3%	20%
Yorkshire	293	364	293	399	0%	10%
WaSC average (weighted)	**314**	**370**	**313**	**390**	**0%**	**5%**
Water only companies						
Bournemouth & W Hampshire	131	150	132	169	1%	12%
Bristol	138	166	146	194	5%	17%
Cambridge	113	129	110	135	-3%	5%
Dee Valley	109	146	109	154	0%	5%
Portsmouth	88	94	78	87	-11%	-8%
South East	141	197	145	227	3%	15%
South Staffs	122	126	120	138	-2%	10%
Sutton & East Surrey	149	170	142	181	-5%	7%
Veolia Central	142	169	133	162	-7%	-4%
Veolia East	156	202	144	206	-8%	2%
Veolia Southeast	165	244	174	253	5%	4%
WoC average (weighted)	**137**	**159**	**135**	**164**	**-2%**	**3%**
Industry average (weighted)	**312**	**367**	**311**	**385**	**0%**	**5%**

This table shows the typical bills that customers might expect to see as a result of our determinations. They show how much customers could expect to pay if they have either a water meter and use an average amount of water, or have an average rateable value – assuming that they do not change their behaviour or how they are charged. The changes in these bills are different from those presented in table 5 as that table calculates the overall change in all charges taking account of all customers' characteristics – not just the averages.

The rate at which unmetered customers opt for a meter has a significant effect on typical metered and unmetered bills. This happens because optional metering unwinds the cross-subsidy that exists within the group of unmetered customers in an uneven way. Those unmetered customers in properties with high rateable values, but who use relatively little water, pay more than it costs to provide their water and sewerage services. Correspondingly, unmetered customers with lower rateable values and higher water use pay less than the costs of the services they receive. When low-use customers with high rateable values opt for a meter, their bills fall to reflect more closely the cost of the service they receive. It would be unfair for such customers to continue to subsidise the remaining unmetered customers, so unmetered charges have to increase. Our regulatory mechanisms make sure that this happens.

The typical bills in the table above take account of switching rates – but they could change. We think that all customers with an unmetered supply should seriously consider whether opting for a meter would be the best way to pay for their water and sewerage services in the future. The table shows some striking figures – particularly in the level of bills for unmetered customers where levels of optional metering are high, such as South West. There, unmeasured customers could have typical unmetered bills of £935 by the end of the period.

2.2.3 Components of the average bill

Average bills have three key financial components.

- **Operating costs** – the day-to-day costs of running the business.
- **Capital charges** – the costs of improving and maintaining companies' assets, such as treatment works, spread over the life of the assets.
- **The return on capital** – interest payments, profit (including dividends) and tax.

Table 10 shows how these output categories have contributed to the key financial components of the average industry bill in 2009-10. Table 11 shows the same for 2014-15. We have set this out for 2009-10 and for 2014-15 to show how the picture changes over the five-year price review period. These tables are 'snapshots' and represent the start and finish points of this price review. They illustrate both the continuing and cumulative impact on bills of the additions required in each price limit period.

Each time we set price limits the costs associated with sustaining the improvements made in the previous period are rolled up into the 'maintaining existing services and serviceability' output category. Similarly, at the next price review the 'maintaining existing services and serviceability' output category will incorporate the ongoing costs of sustaining all the improvements required in the five years from 2010 to 2015, as well as sustaining the improvements delivered since privatisation.

Table 10 Components of the 2009-10 average bill

	Cost component drivers				
Output categories	Operating costs (£)	Capital charges (£)	Return on capital (including tax) (£)	**Total** (£)	**% of total**
Maintaining existing services and serviceability including sustaining **all** improvements delivered in 1990-2005	115	83	101	**299**	**87%**
Plus additions during 2005-10 to:					
1. Maintain **and enhance security of supply**	2	4	5	**11**	**3%**
2. Deliver all the required **improvements to drinking water quality and the water environment**	3	10	17	**30**	**9%**
3. Deliver all the required **service improvements**	0	1	2	**3**	**1%**
Total bills	**120**	**98**	**125**	**343**	
% of total	**35%**	**29%**	**36%**		

Table 11 Components of the 2014-15 average bill

	Cost component drivers				
Output categories	Operating costs (£)	Capital charges (£)	Return on capital (including tax)(£)	**Total** (£)	**% of total**
Maintaining existing services and serviceability including sustaining **all** improvements delivered in 1990-2010	123	94	97	**314**	**92%**
Plus additions during 2010-15 to:					
4. Maintain and enhance security of supply	0	3	5	**8**	**2%**
5. Deliver all the required **improvements to drinking water quality and the water environment**	1	6	9	**16**	**5%**
6. Deliver all the required **service improvements**	0	1	1	**2**	**1%**
Total bills	**124**	**104**	**112**	**340**	
% of total	**36%**	**31%**	**33%**		

Table 1 shows the drivers of the £3 decrease in the average household bill over the five years to 2014-15 from £343 to £340. Table 10 is consistent with this, but allocates our efficiency assumptions to specific drivers. For example, the increase in bills because of the costs of maintaining and enhancing security of supplies is £9 in table 1 before we

applied the efficiency improvement factors, which reduce the net impact on costs to the £8 shown in table 11.

Over time, the operating cost component has risen. This reflects the immediate impact of real world challenges facing the companies such as higher power, business rates and pension costs. At the same time, the need to maintain the expanding asset base leads to higher capital charges. However, our lower assumption on the cost of capital is the most significant driver of the reduction in the proportion of the bill devoted to the return on capital.

2.3 Affordability

Our customer research in autumn 2008 showed that most customers had no difficulty paying their water bills. However, a significant proportion (14% in England and 6% in Wales) said they sometimes found it difficult to pay their bills on time. Economic conditions have remained difficult. We have therefore been particularly careful to ensure that customers are getting value for money and that we take account of their views on companies' proposed business plans and prices.

Our price limits will result in lower bills than the companies' proposed. For a number of companies, our price limits will lead to average bills that are lower than they are now for all or part of the next price review period. Customers in some of the areas where bills are high and incomes relatively low – including Wales and south-west England – will see real falls in bills for the first time since 1999. This will help to ease the pressure on those struggling to pay.

2.4 The infrastructure charge

At price reviews, we set infrastructure charge limits for connecting household premises to water or sewerage services for the first time. The infrastructure charge provides a contribution towards the costs of developing local networks to serve new customers. Companies can levy an infrastructure charge, as well as the direct costs of making new connections.

We have set an infrastructure charge limit of just over £297 for both the water and sewerage services in 2010-11. In the absence of a compelling reason for change, this is the same charge in real terms as we set at the last price review in 2004, but indexed by RPI. Charges for future years will increase in line with RPI.

2.5 Setting price limits in the future

We are committed to improving the role that market mechanisms play in providing customers with better services and value in the future. We are currently working with the industry on an accounting separation project. We intend this to lead to a further project looking at the deconstruction of price limits into indicative subsidiary price limits for each of the business units we identify. This could provide a basis for formally setting separate price limits for each business unit.

3. The right outcome for customers

This chapter outlines the package of outputs included in our price limit assumptions and explains how we have reached our conclusions in each area. It also explains how we have:

- rewarded customer service performance in price limits; and
- worked to understand and take account of customers' views.

3.1 Understanding consumers' preferences

Each company should aim to deliver a service that reflects consumers' preferences. However, in the absence of competition, customers cannot demonstrate their preferences on quality, and price by choosing between alternative suppliers and alternative packages. Accordingly, each company must find other ways to understand what its consumers want and are prepared to pay for. In turn, we need to understand consumers' priorities and preferences to inform our judgements.

3.1.1 Finding out what consumers want

We worked with the following stakeholders on a three-stage consumer consultation process.

- The Consumer Council for Water (CCWater).
- The Department for Environment, Food and Rural Affairs (Defra).
- The Welsh Assembly Government.
- The Drinking Water Inspectorate (DWI).
- The Environment Agency.
- Natural England.
- Water UK.

Stage 1: In 2007, each company carried out consumer research with input from CCWater to inform and develop its longer-term strategic direction statement.

Stage 2: CCWater led a joint stakeholder regional deliberative consumer research project between October and December 2007. The results informed each company's draft business plan proposals.

Stage 3: After each company submitted its draft business plan, we carried out joint consumer research between September and November 2008, working with other stakeholders. This explored consumers' views on their company's proposals, including the acceptability of the proposed outputs

and bill changes. The results and further work by some companies informed the final business plans, and our judgements on them.

3.1.2 What consumers said they wanted

The key message to come out of the 2007 deliberative research (stage 2) was that customers wanted an efficient, safe, reliable water supply at a reasonable price now and in the future, and that everything else was markedly less important.

The 2008 survey (stage 3) covered more than 6,000 consumers in England and Wales; it showed that most customers (86%) were satisfied with current water and sewerage services. Almost two-thirds (64%) of customers stated that the current water and sewerage service was good value for money.

As part of the research, we asked customers (those responsible for paying bills for water and sewerage services) what best described their approach to paying. Most (85%) said that they did not find it difficult to pay their water and sewerage bills on time. However, 11% stated that they usually paid on time, but doing so could be difficult.

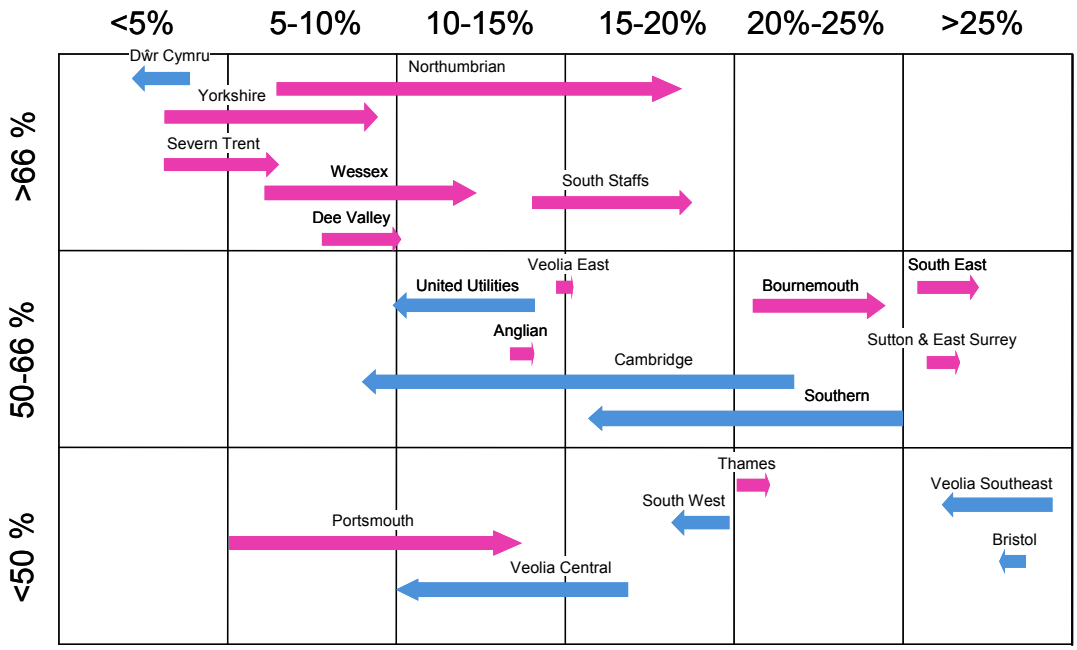
Most companies' draft business plans were acceptable to the majority of their customers. When provided with a short description of the benefits and costs in draft business plans, most customers (64%) thought that the combined water and sewerage plans were acceptable. Even so, just under a quarter of customers found them unacceptable overall, and 7% found them "completely" unacceptable. There was significant variation at the company level; in particular, customers whose proposed overall bill impact/overall percentage bill change was lowest (£20 or less, or 5% and less) were more accepting of their company's overall plan.

Most customers (81%) stated that they would prefer to see "bills change steadily throughout the period, so that they did not see big changes from year to year" rather than bills that fluctuated every year, or that had one big step-up and then remained at that level. Customers expressed the same view when we last set price limits in 2004.

3.1.3 How companies responded to the results of the consumer research

Figure 6 shows the degree of consumer acceptability on the vertical scale measured against the increase in bills proposed in companies' draft and final business plans. A red arrow indicates that bill proposals rose between draft and final plans; a green arrow that proposals reduced. The length of the arrow indicates the scale of the change.

Figure 6 Consumer acceptability and proposed price limit increases



Each company received the information from the joint consumer research project in time to use when developing and finalising its business plan. Most companies found that the results were in line with expectations. Figure 6 shows that there does seem to have been some response by companies to the consumer research.

A few companies – notably Southern and Cambridge – did reduce the bill impacts of their final business plans, particularly where there was a low level of acceptability for the draft business plans. However, it also seems that those with higher levels of acceptability felt able to increase the impact of their proposals. We were somewhat concerned by this response given that at the time the economic climate was continuing to worsen (and most companies emphasised the impact of this on their costs in their final business plans). We believed that all companies really needed to reconsider their proposals in light of the circumstances that their customers were facing.

3.1.4 How we have taken account of consumers' views

We have used the results from the range of consumer research and cost-benefit analysis (CBA) to help to inform our judgements in setting price limits. We have challenged all aspects of companies' plans to make sure that they are delivering value for money and are consistent with consumers' priorities. Where consumers expressed limited support for their companies' draft business plans, we have looked carefully at the justification for additional discretionary expenditure.

In October 2009, CCWater published the results of its independent research into our draft determinations. The final report[1] of CCWater's research concluded that more than four-fifths of respondents found our draft determinations acceptable. More than two-thirds thought the price limits were affordable.

We have also re-profiled the price limits for a number of companies for the first two years. This is to reduce the volatility of price limits and bills.

3.1.5 Customer service and the overall performance assessment

Our current incentive mechanisms include a performance-related adjustment to prices. A company that scores well on the overall performance assessment (OPA) can charge its customers slightly more. Those with poorer performance must charge slightly less. The OPA-related price limit adjustments in these final determinations reflect performance during the five years 2004-05 to 2008-09.

As set out in our methodology paper and as in previous price reviews, we have set the range of potential price limit adjustments from +0.5% to -1.0%. We have continued to use both comparative and absolute assessments of company performance. We compare the absolute performance of each company using the percentage of the maximum achievable score and the same graduated range of price adjustment bands. The comparative assessment uses graduated performance bands set around mean performance. We have compared the water and sewerage companies with the sewerage, water and customer services OPA five-year mean. The water only companies are compared with the five-year mean for water and customer services OPA for all 21 companies.

Our OPA price adjustments are set out in table 12.

We have considered company-specific circumstances. Where a single element of the assessment materially affected a company's performance or where a company score was very close to an adjustment band boundary, we considered carefully what adjustment would be reasonable. For example, we took account of the impact of hosepipe restrictions and major supply interruptions caused by extreme weather in some companies. We have identified affected companies in the table.

To avoid penalising a company twice for the same failure we also checked for any overlaps where we had used the performance data for OPA adjustments and for other decisions such as shortfalls or financial penalties. Although there were some cases where performance data overlapped, no company was disadvantaged.

[1] Customers' Views on Ofwat's 2009 Draft Determinations.

Table 12 OPA price limit adjustments

Five-year OPA score (as percentage of maximum achievable score)	Company	OPA incentive – price limit adjustment
99.9%	Veolia East	0.5
99.3%	Cambridge	0.5
98.8%	South Staffs*	0.4
98.5%	Bournemouth & W Hampshire	0.3
98.2%	Portsmouth	0.3
97.2%	Bristol	0.2
95.7%	Veolia Southeast*	0.1
95.7%	Dee Valley	0
92.9%	Veolia Central	-0.1
92.4%	Sutton & East Surrey*	-0.1
92.2%	South East*	-0.1
95.0%	Wessex	0.2
93.4%	Anglian	0.2
91.9%	Dŵr Cymru	0.1
91.8%	Yorkshire	0.1
88.0%	South West*	-0.1
86.8%	Thames	-0.2
84.9%	Severn Trent*	-0.3
84.6%	Southern*	-0.3
82.5%	United Utilities	-0.5
81.7%	Northumbrian	-0.5

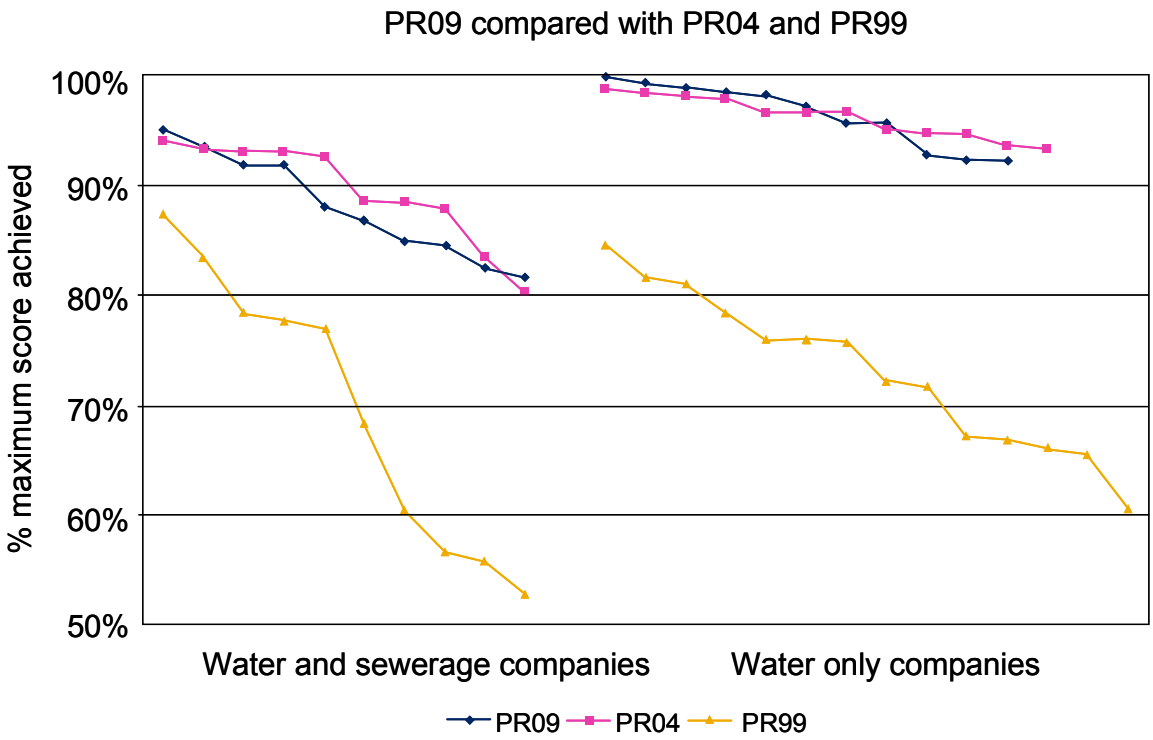
Note:
* Companies where we have taken account of company-specific or boundary issues.

In their comments on our draft determinations, some companies argued for better incentive adjustments. These companies suggested changes to our approach to improve rewards:

- for the water and sewerage companies relative to water only companies;
- for companies whose performance had improved since the last price review; and
- for particular water only companies by comparing them to the water only company average only.

We consider our approach remains appropriate. Figure 7 shows that, although individual companies may have improved, the sectors have not improved their absolute performance scores since the last price review. We therefore consider it reasonable to apply lower rewards for delivering the same absolute performance than at the last price review. Our comparative assessment strengthens the rewards or adverse effect of performing better or worse than comparable companies.

Figure 7 OPA performance comparison



CCWater argued that companies with high levels of complaints, which had provided particularly poor customer service, should receive more negative price adjustments. We set out the weight of different elements within the overall score in 2004. While we recognise CCWater's concerns, it would not be appropriate to change our approach retrospectively.

In August 2009, we consulted on our proposals for a new service incentive mechanism, which would use new measures of consumer experience and replace the OPA for the period 2010-14. Our conclusions and a summary of responses are available on our website.

3.2 What the investment programme will deliver

The companies set out their proposals for capital investment to maintain service and deliver improvements in their final business plans. We considered these in light of the guidance issued by both Defra and the Welsh Assembly Government. We have worked with the appropriate quality regulators (principally the DWI, the Environment Agency and Natural England) to make sure that each company's investment proposals deliver the required outcomes in drinking water quality and environmental performance. We have also considered the views of customers on proposals to improve service.

Our price limits will enable each company to:

- protect and maintain its asset systems, and meet existing statutory and regulatory standards to safeguard current essential services for consumers and the environment;
- reduce sewer flooding risks, where appropriate;
- maintain security of supply and meet new demands for connections to its networks;
- deliver specified service improvements to meet the requirements of the quality regulators. This includes measures identified in the NEP and the improvements to drinking water quality supported by the DWI; and
- put in place identified service improvement measures, including improvements to drinking water consumer acceptability and to resilience to extreme events.

We have reviewed decisions we made at our draft determinations in light of the representations we received from companies, quality regulators, and other stakeholders. In the supply-demand, quality improvements and service level enhancement area these were, by their nature, quite company specific, we have explained our actions in the individual company-specific feedback on our determinations.

We expect companies to continue working to drive value and innovation in delivering the agreed outcomes for drinking water and environmental quality over 2010-15, in consultation with quality regulators as appropriate. We will ensure that our approach to judging output delivery does not stifle the identification of more innovative approaches.

3.2.1 Maintaining the asset networks

We expect all companies to maintain their asset networks so that they are capable of maintaining the flow of services to consumers now and into the future. We will monitor and regulate this by measuring a basket of serviceability indicators for all assets, which include asset performance indicators, water quality compliance, environmental compliance and consumer service indicators. We will assess trends in these ‘serviceability’ indicators to determine if stable serviceability is being maintained. We assess each company’s serviceability in the sub-service areas using four descriptors: ‘improving’, ‘stable’, ‘marginal’ and ‘deteriorating’.

We expect all companies to deliver and maintain ‘stable’ serviceability for all of their asset systems throughout 2010-15 and beyond. In delivering this, companies must monitor, manage and maintain assets so that the serviceability indicators remain within a set range of control limits around a central reference level. This serviceability approach underpins all aspects of maintaining service for consumers.

Table 13 shows our most recent assessments of serviceability for each company. The overall serviceability assessment for the industry as a whole is stable, with only six sub-services across all of the companies classified as marginal. A marginal assessment means we have some concerns that serviceability trends are moving in the wrong direction.

Table 13 Water and sewerage serviceability assessments for 2008-09[1]

	Water infrastructure	Water non-infrastructure	Sewerage infrastructure	Sewerage non-infrastructure
Water and sewerage companies				
Anglian	Stable	Stable	Stable	Stable
Dŵr Cymru	Stable	Marginal	Stable	Stable
Northumbrian	Stable	Stable	Marginal	Stable
Severn Trent	Stable	Improving	Stable	Stable
South West	Stable	Stable	Stable	Stable
Southern	Stable	Marginal	Stable	Stable
Thames	Stable	Improving	Stable	Stable
United Utilities	Stable	Stable	Stable	Marginal
Wessex	Stable	Stable	Stable	Stable
Yorkshire	Stable	Stable	Stable	Stable
WaSC assessment	**Stable**	**Stable**	**Stable**	**Stable**

Water only companies		
Bournemouth & W Hampshire	Stable	Stable
Bristol	Stable	Stable
Cambridge	Stable	Stable
Dee Valley	Stable	Stable
Veolia Southeast	Stable	Stable
Portsmouth	Stable	Stable
South East	Stable	Stable
South Staffs	Stable	Stable
Sutton & East Surrey	Stable	Stable
Veolia East	Stable	Stable
Veolia Central	Marginal	Marginal
WoC assessment	**Stable**	**Stable**
Industry assessment	**Stable**	**Stable**

Note:

1. Assessment is based on a full analysis of 2009 June return assessments.

At the last price review (in 2004), there were 14 out of 64 sub-services classified as marginal or deteriorating (where we had stronger concerns) at this stage. We have worked closely with the companies since then, with most responding positively by delivering action plans and improved serviceability outcomes.

In MD212, 'Asset management planning to maintain serviceability' (February 2006), we said that where companies are unable to demonstrate that they have delivered stable serviceability according to the timetable set out in their determinations, our starting presumption will be a shortfall in service delivery. The shortfall process ensures that customers do not pay for outputs that companies have not delivered.

Accordingly, we have applied shortfall adjustments for two companies with 'marginal' serviceability assessments (Veolia Central for water infrastructure and Dŵr Cymru for water non-infrastructure). We have not applied shortfalls for other marginal sub-services because:

- there is an overlap with other shortfall adjustments (Northumbrian for sewerage infrastructure);
- the marginal assessment reflects sampling or reporting issues and not capital maintenance-related concerns (Southern and Veolia Central for water non-infrastructure); and
- there are clear improvements in performance over a period of nearly two years, which will not be reflected until June return 2010 (United Utilities for sewerage non-infrastructure).

Companies with any sub-service that we currently have assessed as less than stable (marginal or deteriorating) must achieve stable serviceability and demonstrate this in 2012.

In 'Capital expenditure for 2010-15: Ofwat's view on companies' draft business plans' (December 2008), we set out to each company the measures and reference levels that we expected them to achieve as a minimum throughout 2010-15. The companies responded to these reference levels in their final business plans and reviewed the capital maintenance investment they required to maintain stable serviceability. We have reviewed companies' proposed reference levels as part of our assessment of the final business plans and representations; we have determined limits that are appropriate for 2010-15.

In order to monitor companies' performance in maintaining water quality in distribution we have introduced two additional serviceability measures within the water infrastructure area (in consultation with the DWI). These measures are:

- discolouration contacts for every 1,000 of the population; and
- turbidity, iron and manganese index (TIM).

The DWI will collect data for both of these measures and will provide it to us for assessment through the MD109 protocol.

We expect each company to at least maintain its current performance, or where relevant, restore performance to expected levels throughout 2010-15 and beyond. Where we have made a specific price limit assumption to make a stepped improvement in service, we expect a company to deliver this within the timetable set out for that company.

We will monitor each company's performance against these reference levels and where relevant, we will shortfall companies for non-delivery. Failure could lead to a shortfall up to the value of 50% of the capital maintenance expenditure assumed at the previous price review for the relevant sub-service and the associated financing costs. The amount of shortfall that we judge appropriate in respect of serviceability will be proportionate to the nature and the degree of failure.

3.2.2 Sewer flooding

Each company has a duty to provide, improve and extend a system of sewers to ensure its area is drained effectually and should maintain their sewer networks to achieve this. It is the companies' responsibility to respond to customers' sewer flooding problems, investigate possible solutions and prioritise investment to deliver the expected outputs.

Our final determinations include significantly more sewer flooding outputs with increased benefits than were assumed in draft price limits. We have responded to the prominence of this issue in the representations on our draft determinations, and where appropriate pressed companies to clarify benefits or commit to delivering increased outputs.

We have also responded to these concerns by looking more closely at the proposed costs and benefits – using new information wherever possible. This has allowed us to increase the outputs required from the companies for a modest increase in price limits.

All companies should continually review, monitor and prioritise sewer flooding investment as they develop solutions to existing problems and identify new ones. They should not see business plan proposals or price limit decisions as a barrier to the use of new information and the development of innovative solutions in the best interest of customers.

Table 14 sets out our assumptions on outputs for each company in the final price limits together with those in the companies' final business plans

Table 14 Output assumptions for sewer flooding for 2010-15

Company	Company proposal				Final determinations			
	No. of problems solved at risk of flooding internally at least once in 10 years[1]	No. of problems solved at risk of flooding internally at least once in 20 years[2]	No. of external flooding problems solved[3]	Properties and areas receiving mitigation	No. of problems solved at risk of flooding internally at least once in 10 years	No. of problems solved at risk of flooding internally at least once in 20 years	No. of external flooding problems solved	Properties and areas receiving mitigation
Anglian	153	60	295	210 int 100 ext	190	52	246	210 int 100 ext
Dŵr Cymru	203	55	203	10 int	219	65	310	10 int
Northumbrian	1,135	0	0	221 int	1,135	0	0	221 int
Severn Trent	632	603	1,031	795 int 365 ext	511	374	678	525 int 250 ext
South West	87	4	127	30 int 5 ext	87	4	127	30 int 5 ext
Southern	161	139	169	400 int 100 ext	146	127	21	400 int 100 ext
Thames	1,882[4]	144	1,097	648 int 108 ext	1,707	105	676	648 int 108 ext
United Utilities	456	277	326	775 int 426 ext	565	186	315	500 int 426 ext
Wessex	200	138	170	40 int 60 ext	200	138	170	40 int 60 ext
Yorkshire	590	97	163	0	517	51	132	0
Industry total	**5,499**	**1,517**	**3,581**	**3,129 int 1,164 ext**	**5,277**	**1,102**	**2,675**	**2,584 int 1,049 ext**

Notes:

1. This includes work to address existing and forecasts of newly emerging problems.
2. Some of these outputs may be associated with schemes that solve high risk or external problems.
3. Some of these outputs may be associated with schemes that solve internal problems.
4. This includes 406 solutions double counted in the programme to address known problems.

We continue to include work for properties flooded at least once in 20 years and external flooding issues. For those properties that experience flooding, but where permanent solutions are not cost-beneficial, we have included a significant mitigation programme. This includes fitting 'flap valves' and other measures to prevent flooding and mitigate the impact on properties should the sewers become overloaded (2,584 internally flooded properties and 1,049 areas at risk of external flooding).

Table 15 shows how our decision will affect the sewer flooding risk registers, with an overall net reduction in the properties in the highest risk category of 1,368. In our draft determinations, we said that our assumptions would enable companies to remove 1,539 properties from the high-risk registers. This was an overstatement – we have since found that Thames double counted more than 400 properties in its proposed programme to address known sewer flooding problems. When this is taken account of, our new assumptions deliver a larger real improvement than in our draft determinations.

Table 15 Assessment of proposals to reduce risk of sewer flooding for 2010-15

Company	DG5 register position in 2010	Company requested additions	Ofwat calculated additions	Total number of funded solutions	Net reduction in the high-risk registers
Anglian	300	88	88	190	102
Dŵr Cymru	219	180	180	219	39
Northumbrian	768	700	700	1,135	435
Severn Trent	540	585	445	511	66
Southern	213	105	105	146	44[1]
South West	52	70	70	87	17
Thames	1,620	1,848	1,210	1,707	497
United Utilities	975	456	456	565	109
Wessex	110	200	200	200	0
Yorkshire	212	525	458	517	59
Industry	**5,009**	**4,757**	**3,912**	**5,277**	**1,368**

Note:
1. Includes the removal of three properties where no funding was requested.

We have also made different assumptions about the number of new problems that will arise between 2010 and 2015 for some other companies. We made changes where we have received new information about the rate of additions or we did not feel the rate proposed by the company was justified by past data.

For our final determinations, we have assumed activity to alleviate flooding at 1,690 properties that are on the high-risk registers at the start of 2010. Some of these solutions offset new additions that are added to the register towards the end of 2010-2015 and others will compensate for problems that are not cost-beneficial to solve and would otherwise lead to the registers increasing over the next five years.

Our final determination includes 5,277 solutions for properties at a high risk of flooding. The price limit assumptions enable companies to remove 1,368 properties from the high-risk registers. This is a 27% reduction in the register from the forecast position of about 5,000 properties at March 2010, leaving 3,641 on registers with a risk of flooding at least than once in ten years.

We have also assumed that companies will provide mitigation for at least 2,584 properties that suffer from sewer flooding. This will help provide protection for properties where there is no cost-beneficial solution or where no immediate solution is available.

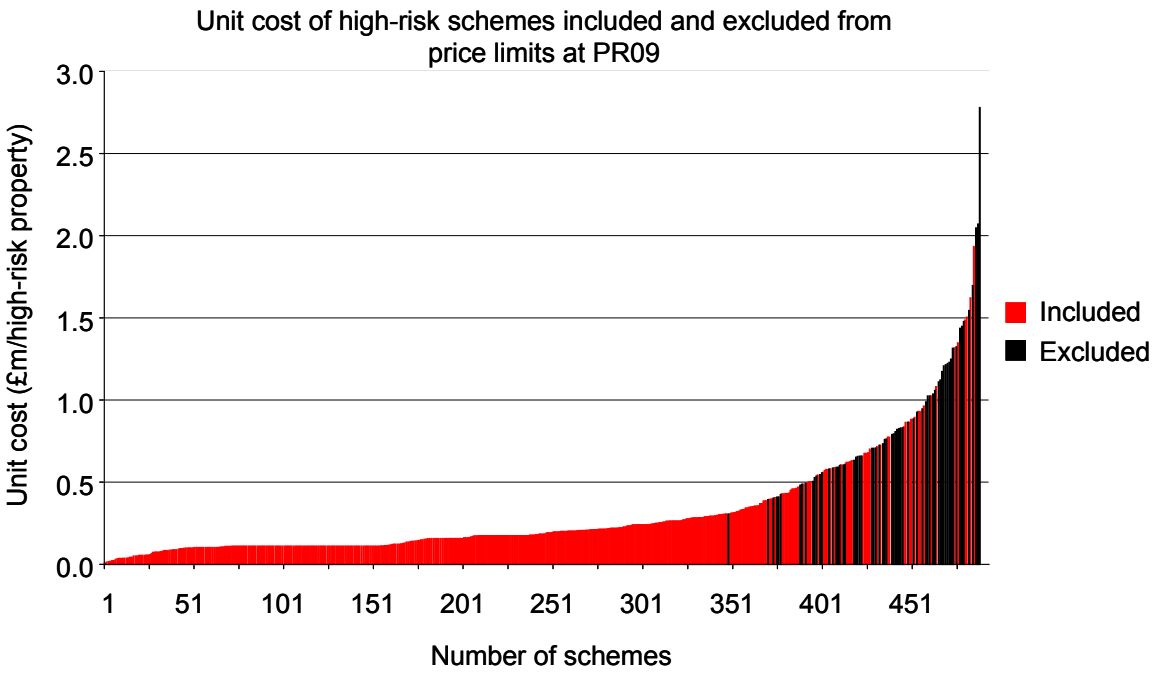
Rising unit costs

While the price limits we set in 2004 enabled companies to deal with a proportion of higher cost problems during 2005-10, many of the properties remaining on the registers at 2010 require solutions that cost more than the current five-year average solution cost. As the percentage of properties on the high-risk registers fall, there is a trend for

solutions to become more expensive. Companies have told us they have already delivered many of the low cost solutions with an upward trend in the cost of solutions going forward into 2010-15.

Using the final business plan submissions, we have carefully considered the balance of scheme cost and benefit for sewer flooding schemes whilst taking into account the companies' CBA. Figure 8 shows the profile of unit costs for the schemes proposed by companies within their final business plans and representations. It shows that while some companies are still dealing with problems with relatively low unit costs of between £200,000 and £250,000, there is a significant upturn in the unit cost of solutions, with some companies proposing very high cost schemes of up to £1 million or £2 million per property removed from the register.

Figure 8 Unit cost of high-risk schemes included and excluded from price limits at PR09



Where a solution has a very high unit cost or is not cost-beneficial, companies should examine alternatives, including those that provide a slightly lower level of protection. More complex mitigation solutions may be appropriate in these cases. It remains the company's responsibility to continue investigating and identifying alternative solutions to emerging problems and keep customers informed of progress until it has alleviated the risk of flooding.

Most companies have seen a drop in the number of properties on the 2-in-10 and 1-in-10 registers since 2005. The improvements result from capital investment and improvements in data. As companies have investigated problems and carried out

solutions, they have improved their understanding of flooding risk. Many companies now have very low numbers on the risk registers and a high confidence in this position.

Some companies have re-assessed the way they have allocated properties to the risk registers during 2005-10. We understand the reasons behind the changes and expect registers to reflect the risk of flooding to properties that have already flooded. We are examining ways of introducing a proactive risk based register that will reflect both the impact of flooding as well as the frequency of flooding.

3.2.3 Odour from sewage treatment works

Our price limits will enable companies to deal with sewage treatment odour problems at a number of operational sites, such as sewage works and pumping stations. Table 16 shows the number of odour treatment sites included in our final determinations. We have challenged the companies on the expenditure required to deliver these benefits to consumers.

Table 16 Odour treatment sites by company

	Number of odour treatment sites	
Company	**Sewage works**	**Pumping stations/ network sites**
Anglian	2	89
Dŵr Cymru	22	18
United Utilities	3	0
Northumbrian	2	0
Severn Trent	16	0
Southern	4	0
South West	14	0
Thames	9	0
Wessex	0	0
Yorkshire	3	0
Total	**76**	**107**

3.2.4 Sewage sludge treatment, recycling and disposal

Most investment in sewage sludge treatment, recycling and disposal is to maintain, optimise and/or expand anaerobic digestion facilities. Expansion in this area improves the opportunities for companies to generate renewable energy. This in turn will allow them to reduce their own energy costs, with future benefits for customers, and the investment will lead to an increase in the renewable energy that the companies generate of 266 GWh/year by 2014-15. Table 17 shows the total energy that each company will generate from sewage sludge processing in 2014-15.

Other investment by the companies ensures that sludge treatment sites meet environmental permit conditions, and facilitates sludge recycling in newly designated nitrate vulnerable zones.

Table 17 Energy generated from sewage sludge processing by 2014-15

Company	GWh/year
Anglian	87
Dŵr Cymru	46
Northumbrian	71
Severn Trent	180
South West	10
Southern	64
Thames	288
United Utilities	125
Wessex	51
Yorkshire	43
Industry total	**965**

3.2.5 Supply and demand balance for water and sewerage

Our price limit assumptions allow each company over the next five years to:

- meet target headroom in all water resource zones, delivering a security of supply index of 100 by 2014-15;
- maintain leakage at the identified sustainable, economic level, delivering reductions where appropriate;
- meet water efficiency targets;
- install water meters in line with legal obligations;
- connect new properties to the water and sewerage network; and
- expand the sewerage network and sewage treatment capacity as required to accommodate new demand with no deterioration in service levels.

3.2.6 Security of supply

The security of supply index is an indicator of the extent to which a company is able to guarantee its planned level of service. A company with a security of supply index of 100 should not need to impose restrictions on use more frequently, on average, than it states in its planned level of service. Most companies will have achieved a security of supply index of 100 by 2009-10. We expect all companies to maintain or achieve a security of supply index of 100 by 2014-15.

With growing pressures on water supply and demand, many companies need to increase supply or manage demand in order to achieve their targets for security of supply. Table 18 shows the total volumes of water that the companies must make available from increased supply or demand savings by 2014-15. The similarity between

the volume delivered through supply enhancements and demand savings indicates that the industry as a whole is pursuing a twin-track approach.

Table 18 Supply/demand capacity enhancements (dry year)

Component	Increase in capacity by 2014-15 (Ml/d)	% of 2008-09 water delivered
Supply-side enhancements (Ml/d)	159	1.35
Demand-side water savings (Ml/d)^	164	1.39
Total enhancements (Ml/d)	323	2.74

Note:
^ Includes demand savings from selective metering, enhanced water efficiency (SELWE) and leakage reductions. Excludes savings from optional metering and base service water efficiency.

3.2.7 Leakage and water efficiency

We expect companies to achieve targets for two of the demand-side measures – leakage and water efficiency. As population growth and climate change put increasing pressure on our water resources, it is even more important that we waste as little water as possible. The companies must play their part by maintaining leakage at a sustainable, economic level.

Even if it were possible, eliminating leakage altogether would be a wasteful use of resources. The cost of doing so, including the substantial environmental impacts, would far exceed the cost of balancing water supply and demand by other means, and that would mean higher bills for customers. Instead, we expect companies to keep leakage down to a sustainable, economic level. Below this level, the costs of additional leakage control would exceed the benefits. We expect each company to measure costs and benefits comprehensively – taking account of the environmental impact of leakage control and other options, and of customers' views.

Each company has a duty to promote the efficient use of water by customers. We monitor the companies' performance against this duty, but we have not previously had a quantitative framework for doing this. In PR09/20, 'Water supply and demand policy' (November 2008), we confirmed our proposals for water efficiency targets, which will provide such a framework. Our targets are made up of two elements.

- A **base service water efficiency target**, which is equivalent to one litre per property per day for all companies. This target reflects the level of activity that we judge companies should undertake to meet their duty.

- A **sustainable, economic level of water efficiency**, which forms part of a best-value strategy to balance the supply and demand for water, bringing benefits to consumers and to the environment.

We have set out targets on leakage in table 19 and on water efficiency in table 20.

We expect companies to maintain leakage at current levels or to reduce it slightly over 2010-15. Some stakeholders expressed concern, following the draft determination, that we were not pressing companies to reduce leakage significantly over 2010-15. In most cases, however, the evidence suggests that more significant reductions over this timescale would represent poor value for customers and the environment (although Severn Trent is a notable exception). Moreover, with an expanding pipe network, maintaining leakage at current levels still requires companies to increase their leakage control activity because even new pipes leak.

Table 19 Leakage assumptions 2010-11 to 2014-15

	Leakage assumptions (Ml/d)				
	2010-11	2011-12	2012-13	2013-14	2014-15
Water and sewerage companies					
Anglian	212	212	211	211	211
Dŵr Cymru	190	188	186	185	184
Northumbrian					
Northumbrian	150	150	150	150	150
Essex & Suffolk	66	66	66	66	66
Severn Trent	483	474	468	456	453
South West	84	84	84	84	84
Southern	83	80	79	78	77
Thames	674	673	673	673	673
United Utilities	464	464	464	463	463
Wessex	71	71	71	71	71
Yorkshire	297	297	297	297	297
Water only companies					
Bournemouth & W Hampshire	22	22	22	22	21
Bristol	52	51	50	49	49
Cambridge	14.0	14.0	14.0	14.0	14.0
Dee Valley	10.2	10.2	10.2	10.2	10.2
Portsmouth	30	30	30	30	30
South East	95	95	94	94	93
South Staffs	74	74	74	74	74
Sutton & East Surrey	25	25	25	25	25
Veolia Central	185	185	185	185	185
Veolia East	5.1	5.1	5.1	5.1	5.1
Veolia Southeast	7.9	7.8	7.7	7.6	7.5
Industry total	**3,294**	**3,278**	**3,266**	**3,250**	**3,243**

Note:
Totals may not add up because of rounding (less than 20 Mld to 1 decimal point; above 20 Mld no decimal points).

Most companies' water efficiency targets comprise only base service water efficiency. We have assumed additional water efficiency measures – a sustainable, economic level of water efficiency (SELWE) – for:

- Anglian;
- Dŵr Cymru;
- South West;
- Thames;
- United Utilities; and
- Bristol.

Table 20 Water efficiency assumed savings

	Water efficiency assumed savings (Ml/d)				
	2010-11	2011-12	2012-13	2013-14	2014-15
Water and sewerage companies					
Anglian	2.45	2.45	2.45	2.45	2.45
Dŵr Cymru	1.32	1.32	1.32	1.37	1.38
Northumbrian					
Northumbrian	1.12	1.12	1.12	1.12	1.12
Essex & Suffolk	0.74	0.74	0.74	0.74	0.74
Severn Trent	3.27	3.27	3.27	3.27	3.27
South West	1.39	1.39	1.39	1.39	1.39
Southern	1.01	1.01	1.01	1.01	1.01
Thames	4.42	4.42	4.42	4.42	4.42
United Utilities	3.02	3.02	3.02	3.02	3.02
Wessex	0.55	0.55	0.55	0.55	0.55
Yorkshire	2.05	2.05	2.05	2.05	2.05
Water only companies					
Bournemouth & W Hampshire	0.19	0.19	0.19	0.19	0.19
Bristol	0.80	0.80	0.80	0.80	0.80
Cambridge	0.12	0.12	0.12	0.12	0.12
Dee Valley	0.12	0.12	0.12	0.12	0.12
Portsmouth	0.29	0.29	0.29	0.29	0.29
South East	0.84	0.84	0.84	0.84	0.84
South Staffs	0.53	0.53	0.53	0.53	0.53
Sutton & East Surrey	0.27	0.27	0.27	0.27	0.27
Veolia Central	1.24	1.24	1.24	1.24	1.24
Veolia East	0.04	0.04	0.04	0.04	0.04
Veolia Southeast	0.07	0.07	0.07	0.07	0.07
Industry total	25.85	25.85	25.85	25.90	25.91

Note:
Totals may not add because of rounding.

3.2.8 Metering

Table 21 shows our assumptions about the meters that companies must install under the free meter option and meters installed compulsorily or on change of occupier. Under these assumptions, the proportion of household customers with a meter will increase

from about 37% in 2009-10 to about 50% in 2014-15. In regions that the Environment Agency has classified as seriously water stressed, the proportion will rise to about 57% by 2014-15.

In the long term, we think that all customers should pay for water according to how much they use. It is the fairest system of charging, and it encourages consumers to use water wisely.

In most cases, customers are setting the pace at which companies move towards fully (or near-fully) metered charging. Customers can opt to have a meter installed free of charge, and many do so to reduce their bills. However, companies can also help set the pace of metering. They are entitled to install meters when there is a change of occupier at a property. In addition, in areas that the Environment Agency defines as seriously water stressed, companies can install meters at their discretion, subject to ministerial approval of their water resource management plan proposals. Our determinations support extensive compulsory metering for Southern, South East, and Veolia Southeast. For Southern and Veolia Southeast, we expect household metering levels to be at least 90% by the end of 2015.

We have accepted most companies' proposals for additional metering. Some failed to demonstrate that the benefits of metering would exceed the costs in areas where they did not need to reduce water use in order to balance supply and demand. We did not accept these companies' proposals for our final determinations.

Following this price review, we will work with the Environment Agency and other stakeholders to develop a more robust framework and improved evidence base for companies to assess the costs and benefits of accelerated metering and smart metering. We indicated in our response to the independent review of charging for household water and sewerage services (chaired by Anna Walker) that we would set up a steering group to help deliver these objectives. We will establish this group early in 2010. If, in light of this work, companies are able to demonstrate a clear case for additional metering, we will consider how to take this forward.

Table 21 Metering assumptions 2010-11 to 2014-15 totals

	Optional meters (000)	Additional meters (000)	% of household customers metered by 2014-15
Water and sewerage companies			
Anglian	124	185	81
Dŵr Cymru	99	0.5	41
Northumbrian	101	55	43
Severn Trent	198	11	42
South West	79	0	79
Southern	22	465	92
Thames	139	86	37
United Utilities	232	3.2	38
Wessex	49	0	58
Yorkshire	163	0	48
Water only companies			
Bournemouth & W Hampshire	11.3	7.4	66
Bristol	35.4	16.8	46
Cambridge	6.2	0	70
Dee Valley	8.5	0	58
Portsmouth	25	0	24
South East	19.4	176	68
South Staffs	30.5	15.9	35
Sutton & East Surrey	8.4	23.5	47
Veolia Central	50.0	0	44
Veolia East	3.9	0	71
Veolia Southeast	0.8	8.5	90
Industry total	**1,405**	**1,053**	**50**

3.2.9 New connections

We have assumed that companies will connect an additional 998,000 properties to the water service and 996,000 properties to the sewerage service over 2010-15. This represents an increase from our draft determinations on the number of new connections over 2005-10, which were 948,000 and 898,000 for water and sewerage, respectively.

We expect companies to fulfil their statutory duties and allow connection to the water and sewerage system for all new developments. We set price limits to enable efficient companies to meet their statutory duties, including their statutory obligations to permit connections to the water and sewerage systems. Companies must not seek to delay work just because in their view, price limits do not provide for it. We expect them to liaise with planning authorities to make sure that plans deliver best value outcomes.

3.2.10 Sewage treatment capacity

Companies plan to increase their sewage treatment capacity to keep pace with increased demands from population growth. Overall, companies propose to expand their

treatment capacity to meet the demands of an additional 1.8 million people, although they are projecting population growth of 1.5 million people. We have accepted companies' plans to expand capacity at a greater rate than population growth, because:

- they need to address existing under-capacity; and
- some companies are investing strategically to anticipate growth in future planning periods.

We will monitor companies' progress carefully.

3.2.11 Drinking water quality

Price limits will allow companies to undertake necessary improvements, including further treatment to address nitrate problems, cryptosporidium risk, and pesticide removal, as agreed with the DWI. Price limits also include assumptions for more than 100 catchment management schemes and investigations proposed by companies in their final business plans. These provide for action or investigation at the catchment level to address deteriorating raw water quality, rather than pursuing traditional, capital-intensive treatment solutions.

As well as potential savings in both capital and operating expenditure, catchment approaches could deliver longer-term benefits, including reduced greenhouse gas emissions, improved biodiversity and contributing to more stable river flows. We want to ensure that a full understanding of what catchment management can deliver is captured to maximise the overall benefits of this investment. To achieve this, we will work with the companies and the quality regulators to put in place reporting and monitoring mechanisms that will allow us to identify and assess value added and to promote good practice.

Our price limits also allow the following.

- **Continuing reductions in lead levels, but excluding work related to customer-owned supply pipes.** We do not believe that customers as a whole should meet the cost of such work, particularly as some have already paid to have their lead supply pipes replaced and most continue to have no problems with lead. We recognise the challenges that some companies may face when the new 10µg/l lead standard comes into effect in 2013 and we will continue to work with the DWI and others on the way forward.

- **Companies to meet their environmental obligations relating to drinking water provision.** These are primarily investigations into the hydrological and ecological impacts of abstraction, and schemes to meet the requirements of the Water Framework Directive, the Habitats Directive, the UK Biodiversity Action Plan and the Countryside and Rights of Way Act.

- **Companies to address drinking water related aspects of the Security and Emergency Measures Direction.**

Table 22 summarises the schemes (including investigations) to improve drinking water quality included in price limits. It reflects the increase in projects arising from additional DWI guidance since draft business plans.

Table 22 Driver actions for drinking water quality, environmental and other obligations in 2010-15

	Number of enhance-ments (based on driver count)	Number of investi-gations (based on driver count)	Total driver actions
Water treatment			
Nitrate removal – to reduce high nitrate levels caused by diffuse pollution present in sources of water used for the drinking water supply	18	1	19
Plumbosolvency control – conditioning of the water supply so it dissolves less lead from companies' and customers' pipework	27	0	27
Trihalomethane reduction – changes to company assets to reduce the level of by-products of disinfection to comply with water quality regulations	16	0	16
Turbidity reduction – to improve the clarity of the water supply	10	0	10
Cryptosporidium risk reduction – required measures to companies' assets to reduce contamination from cryptosporidium	52	0	52
Pesticide removal – to reduce pesticides levels present in sources of water used for the drinking water supply	9	3	12
Other – other work supported by DWI at water treatment works	36	1	37
Water distribution			
Lead communication pipe replacement – replace companies' pipework, where necessary to help meet lead standards at customers' taps	25	1	26
Other obligations			
Schemes to improve acceptability of drinking water to consumers – for example, colour, taste, odour.	18	1	19
Security and Emergency Measures Direction – schemes to protect assets and maintain supplies during emergencies	116	0	116
Water quality monitoring investigations	3	14	17
Miscellaneous	18	16	34
Environmental obligations			
Habitats and Birds – compliance with EU Directives through reducing water abstraction affecting valuable nature conservation sites and threatened species	28	6	34

Countryside and Rights of Way Act 2000 – reducing water abstraction affecting sites of special scientific interest	4	8	12
UK Biodiversity Action Plan – reducing water abstraction to further the conservation of biodiversity	12	16	28
Water Framework Directive – schemes to implement river basin management plans to be approved by UK Ministers in order to meet EU WFD requirements	1	29	30
Local priority – changes to water abstraction of significant local importance	0	21	21
Sub-total – new work identified for 2010-15	**393**	**117**	**510**
Interaction with 2005-10 quality programme			
Projects from 2005-10 to be completed in 2010-15	8	0	8
Programme for drinking water, environmental and other obligations	401	117	518

Note:
We have used information provided by companies in the projects database and annex 4 of the supplementary reports in the production of this table.

3.2.12 Environmental quality improvements

Our price limits include environmental improvements necessary to satisfy companies' statutory and regulatory requirements. We have set out the specific programme for each company in the supplementary material sent as part of our final determination. We have worked closely with the quality regulators to establish a programme of investment that delivers their requirements and has been rigorously tested for value, taking into account customers' preferences and the current economic climate.

This includes work needed to implement the Water Framework Directive (WFD) and other EU Directives, including those covering Urban Waste Water Treatment, Bathing Waters and Habitats, as set out in the Environment Agency's NEP.

We have worked particularly closely with the Environment Agency on the possible application of the disproportionate cost assessment under the WFD. Price limits exclude a number of schemes that are provisional candidates for exemption under Article 4 of the WFD because of an extremely poor benefit:cost ratio. Ministers will take final decisions on schemes to be included in the initial river basin management plans in December 2009.

Excluding the WFD schemes mentioned above, our price limits include more than 99% of the quality schemes included in the current NEP (to be finalised early in 2010).

Our price limits also include work needed to enable compliance with revised flow conditions in discharge consents. Table 23 summarises the improvement programme showing the number of projects (including investigations) in each key area.

Table 23 Outputs for environmental quality and other obligations in 2010-15

	Number of improve-ments[1]	Number of investi-gations	Total number of outputs
Compliance with EU directives			
Urban Waste Water Treatment – upgrades to sewage treatment works to produce cleaner discharges to the environment	91	0	91
Unsatisfactory intermittent discharges – to limit pollution from combined sewer overflows, emergency overflows and storm tanks	100	2	102
Groundwater – investigations and improvements to treated effluents and intermittent discharges which may affect groundwater	84	29	113
Freshwater Fish – reduction in levels of pollutants, principally ammonia in discharges from sewage treatment works to allow more favourable habitats for fish	31	7	38
Bathing Water Directives – investigating and improving sewage treatment works and overflows to assist compliance with EU microbiological standards	102	32	134
Shellfish Waters – reduction of microbiological pollution to ensure a suitable environment for shellfish	81	28	109
Habitats – improvement in quality of discharges to safeguard valuable nature conservation sites and threatened species	71	0	71
Water Framework Directive – schemes and investigations in accordance with the river basin management plans (to be approved by UK Ministers) in order to meet WFD requirements. Typically covers objectives for ammonia, phosphorus, biochemical oxygen demand and dissolved oxygen standards in rivers and discharges to groundwater	87	52	139
Water Framework Directive (Chemicals) – investigations to quantify risk from chemicals, assess catchment sources and assess treatment options	0	125	125
National legislation and policy initiatives			
Countryside and Rights of Way Act – investigations and improvements to the quality of water affecting sites of special scientific interest (SSSIs)	16	17	33
Biodiversity Action Plan – water quality improvements and studies to meet conservation targets under the UK Biodiversity Action Plan	2	9	11
First-time sewerage – connecting properties to the public sewerage system to address actual or potential environmental or amenity problems caused by the existing drainage arrangements	63	1	64
Local priority – improvement schemes and studies that are of significant local importance	2	7	9
Environmental Permitting Regulations – schemes to provide first time combined heat and power (CHP) or pollution prevention measures	51	2	53
Sewage sludge management – schemes to address the impact of extending designations of nitrate vulnerable zones	14	0	14

Sustain planned level of environmental protection – improvements needed to ensure continued achievement of standards established at previous price reviews (for example, dealing with misconnections)	2	0	2
Discharge flow limit increases – schemes identified to ensure no deterioration in the current classification of water as a result of increased volumes of sewage	185	0	185
Security and Emergency Measures Direction – schemes to protect assets and assessments of further improvements needed beyond 2015	16	4	20
Sub-total – new work identified for 2010-15	**998**	**315**	**1,313**
Other, including interaction with 2005-10 quality programme	42	0	42
Quality programme for the sewerage service	**1,040**	**315**	**1,355**

Notes:

1. Improvements include schemes categorised as enhancing the sewerage system, sewage treatment works or sludge disposal facilities, or involving the provision of event and duration monitors at storm overflows.
2 The number of outputs should not be taken as the number of sites or assets being improved (or investigated). Some outputs will cover several sites while some sites are affected by more than one obligation and therefore will have more than one output associated with them.
3 This table is not directly comparable with table 20 in our draft determination national document. At draft determination outputs were allocated to obligations on the basis of the driver assigned to be the primary cost driver by companies in their final business plan. However, for final determination we have recorded an output for each cost driver that applies.

3.2.13 Climate change

Companies' strategic direction statements highlighted climate change as a key challenge. Most considered it one of their priority items. Understanding the impacts of climate change and finding innovative solutions were common themes throughout the strategic direction statements. In their business plan proposals, many companies recognised the long-term nature of climate change, requiring investments beyond this current review period.

Our aim is to safeguard sustainable water and sewerage services both now and in the future. This underpinned our approach to assessing business plans and we have challenged companies to demonstrate an awareness of how sustainability affects all aspects of their operations and long-term planning. In 'Preparing for the future – Ofwat's climate change policy statement' (July 2008), and our feedback on draft and final business plans, we encouraged each company to take a coherent and full account of climate change. Specifically, companies need to adapt to the unavoidable impacts of climate change and mitigate the industry's future impacts from their greenhouse gas emissions.

Adaptation

Adaptation in the form of increased resilience featured strongly in companies' strategic direction statements. This was reflected in the final business plans. The experience of the 2007 floods and a greater appreciation of the increased potential for extreme weather events because of climate change led to a significant number of proposals to increase resilience. These took the form of:

- network resilience projects, which protect from a number of hazards; and
- asset-specific flood resilience measures.

In total, our final determinations include resilience schemes that benefit almost 10 million consumers. Table 24 lists further details of resilience schemes.

It is vital that companies take the most up-to-date evidence on the impact of climate change on the balance between water supply and demand into account. The evidence available to companies when they prepared their final business plans was out of date and soon to be superseded by the UKCP09 scenarios. We explained in our draft CIS baseline that we would not allow for significant climate change-driven expenditure to balance water supply and demand in price limits without satisfactory supporting evidence based on UKCP09 scenario analysis.

Recognising that UKCIP has published the UKCP09 scenarios at too late a stage in the price review process for companies to assimilate its impact on their plans, our final determinations include a notified item on climate change and water resources. We discuss this further in section 4.4.1. Our approach aims to make sure that each company makes water resource investment decisions based on robust evidence, and that they do not have to delay those decisions unnecessarily because of the price review timetable.

Table 24 Details of climate change adaptation and mitigation measures

Adaptation	Mitigation
By 2016, 9.6 million people will benefit from increased service resilience to external hazards, such as flooding	We included all of the 33 stand-alone renewable energy schemes proposed within price limits
We included £414 million for network and asset resilience schemes	We included £57 million for renewable energy projects, delivering £8.8 million of operational expenditure savings to customers every year when complete.
Companies will protect more than 150 critical, at-risk assets and carry out 13 major network resilience schemes	By 2015, companies will be generating over more than 1TWh a year from renewable energy sources
More than 100 catchment management and investigation schemes are included in price limits – at the last price review there were only two such schemes	This saves the equivalent of more than half a million tonnes of $C0_2e$ each year

Mitigation

Companies identified reducing greenhouse gas emissions as a key issue in their strategic direction statements. Many set themselves ambitious, long-term, carbon targets. In most cases, specific details of how they would achieve targets failed to appear in their business plans.

Including the shadow price of carbon within CBA at this price review made companies consider the carbon implications of their proposals and promoted mitigation actions to reduce emissions. After our draft determinations, we asked companies, where

appropriate, to take account of the Government's new non-traded price of carbon. This change almost doubled the price of carbon. Details were set out in PR09/33, 'An updated carbon price for use in investment appraisals' (August 2009). This change affected decisions for a small number of schemes.

Carbon reduction featured in a number of ways – through increased efficiency, asset maintenance regimes, innovation and renewable energy generation. We will see a step change in the amount of renewable energy generated, with an increase of more than 42% between 2009-10 and 2014-15. In total, companies will deliver an extra 300 GWh of renewable energy a year.

The largest changes in renewable energy generation come from companies' sludge strategies. Details of the energy that each company generates from sludge are in section 3.2.4 (table 17). We have considered carefully how these schemes deliver benefits to customers. In most cases, changes to sludge strategies deliver multiple long-term benefits – wider than just renewable energy generation.

We have also included renewable energy generation schemes that fall outside the companies' sewage sludge programmes (and which are clearly part of the appointed business) if they are justified by the long-term benefits to customers. When the schemes are fully operational (2015-16), they will generate 88 GWh of renewable energy each year. Our price limits will pass on financial benefits to customers through reduced operational costs for companies. As well as the financial benefits, the wider population and the environment gains from lower overall emissions. Further details are set out in table 24.

Our price limits also allow for a significant increase in work on catchment management. This is where work takes place to manage the upstream parts of a catchment area to improve raw water quality (see section 3.2.11). These proposals offer potential to contribute to both climate change adaptation and mitigation. They can offer a lower carbon outcome by reducing the need for end-of-pipe, energy-intensive, hard-engineering solutions. Seventeen water companies made catchment management proposals for drinking water quality in their final business plans. At the last price review in 2004, there were only two such schemes.

We are pleased to see companies beginning to address the challenges that climate change presents, although we would like to see the evidence base for specific investment cases strengthened. We will summarise learning points from companies' work in separate publications after the final determinations. Looking forward, we challenge the companies to build on their work, taking forward the new UKCP09 scenarios to understand the impact of climate change.

3.2.14 Large projects

In March 2007, the Government announced its decision to support the development of a full tunnel and treatment solution to improve the river water quality of the tidal River Thames. We have included expenditure for Thames on the London Tideway Tunnels. This comprises two projects.

- The Lee tunnel from Abbey Mills pumping station to Beckton sewage treatment works.
- The Thames tunnel from West London to Beckton sewage treatment works.

The combined tunnels will provide storage of 1.6 million cubic metres and the Beckton pumping station will empty the tunnel in 48 hours. The Lee tunnel is scheduled for completion by the end of 2014. For Thames' draft determination, we developed an adapted regulatory approach with the company to reflect the specific risks of the project and to incentivise efficient delivery. This approach dealt with the project outside of the CIS mechanism. Thames informed us that it would prefer the expenditure relating to the Lee tunnel to be considered in the CIS mechanism and we have done this for our final determinations.

There remains a range of possible funding and delivery models for the longer Thames tunnel, which is not due for completion until 2020 (including possibly delivery by a specialist project company). We have included expenditure only relating to scheme development and known land acquisition costs. We have included a notified item for land acquisition for the Thames tunnel component of the London Tideway Tunnels. This defines as a notified item the acquisition of land greater than the amount allowed in price limits subject to set criteria.

We will work with Thames and other stakeholders over the coming months to assess the feasibility of alternative delivery models.

3.3 Other service enhancements

Some companies' plans identified a need to improve other aspects of customer service. The most commonly proposed improvement was to tackle localised issues of discoloured drinking water. We have assessed these proposals as part of companies' ongoing maintenance plans.

Our final determinations also allow for:

- improved water pressure to 154 homes in Wales, Yorkshire and Cambridge;
- surveying 1 million households in the Severn Trent region to identify and solve low pressure caused by shared supply pipes; and

- a pilot study to improve taste and odour of drinking water, benefiting 100 households each year in the Northumbrian and Essex & Suffolk regions and to inform future strategy.

4. Understanding the costs of delivery and our assumptions for future expenditure

This chapter sets out our final assumptions on costs and expenditure. We explain how we have reached our conclusions on the expenditure included in price limits, including how we have used the CIS and our approach to efficiency.

We show the expenditure assumptions included in our final price limits and companies' proposals for their final business plans in table 25. We have included the five-year total for capital expenditure and show the annual average for operating expenditure.

Table 25 Projections of expenditure 2010-15 (post-efficiency and CIS)

	Final business plans			Final determinations		
	Water	Sewerage	Total	Water	Sewerage	Total
Capital expenditure[1] (five-year total – £bn)						
Base service:						
Infrastructure renewals expenditure	2.8	1.4	4.2	3.2	1.4	4.7
Non-infrastructure capital maintenance	3.7	4.8	8.5	3.6	4.6	8.2
Supply/demand balance	1.9	1.5	3.4	1.4	1.3	2.7
Quality enhancements	1.4	3.9	5.2	1.1	3.4	4.6
Enhanced service levels	0.7	1.1	1.8	0.3	0.8	1.1
Large projects	0.2	1.0	1.1	0.0	0.9	0.9
Total	**10.6**	**13.6**	**24.2**	**9.6**	**12.5**	**22.1**
£ per property	440	584	1,024	398	539	937
Operating expenditure (annual average – £m)						
Base service	2,074	1,593	3,667	1,995	1,584	3,579
Supply/demand balance	42	23	65	26	15	41
Quality enhancements	35	75	110	14	57	71
Enhanced service levels	2	1	4	1	2	3
Large projects	<1	<1	<1	0	<1	<1
Total	**2,153**	**1,692**	**3,845**	**2,036**	**1,658**	**3,694**
£ per property	89	73	162	84	71	156

Note:

1. Capital expenditure is net of capital contributions.

4.1 Capital expenditure

Table 26 shows the capital expenditure included in price limits for each company.

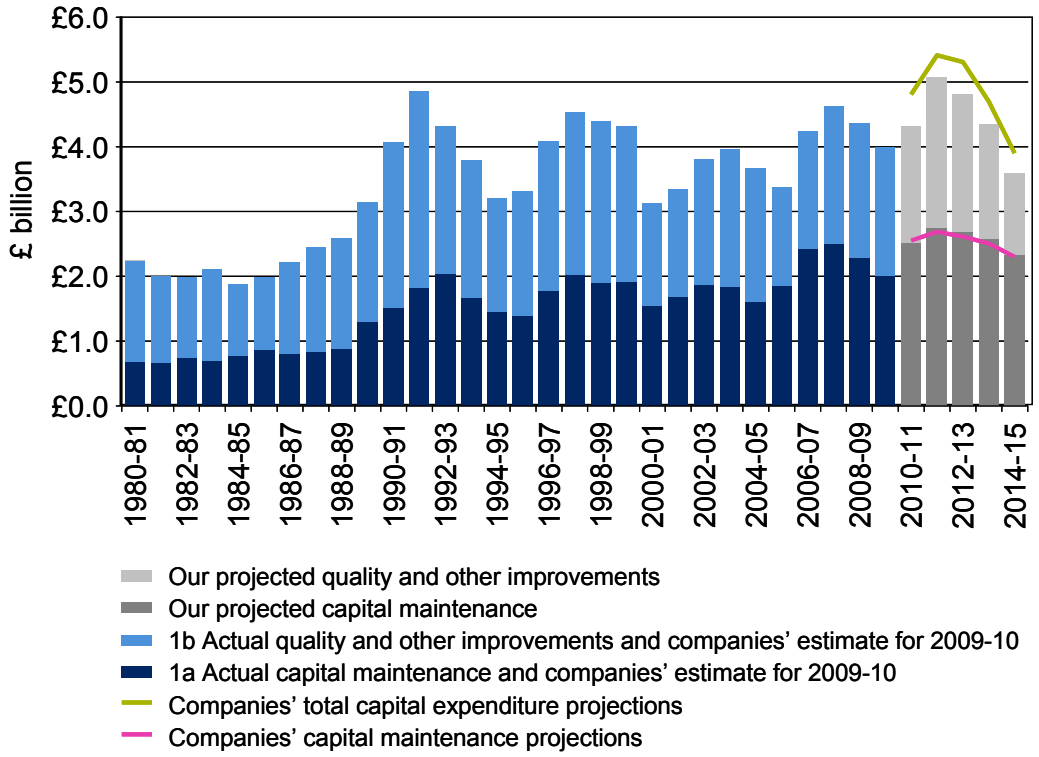
Table 26 Capital expenditure by company (post-efficiency and CIS)

	Capital expenditure (five year total) 2010-15 (£m)					
	Water	Sewerage	Total	Water £/property	Sewerage £/property	Total £/property
Water and sewerage companies						
Anglian	938	1,184	2,122	469	462	931
Dŵr Cymru	536	567	1,104	401	418	820
Northumbrian	709	509	1,217	369	430	799
Severn Trent	1,100	1,351	2,452	328	353	681
South West	294	378	672	378	545	923
Southern	468	1,283	1,752	450	693	1,142
Thames	1,513	3,400	4,913	424	618	1,041
United Utilities	1,384	2,188	3,572	455	722	1,177
Wessex	485	531	1,016	843	457	1,301
Yorkshire	727	1,149	1,875	345	546	891
WaSC total	**8,154**	**12,540**	**20,694**	**413**	**539**	**952**
Water only companies						
Bournemouth & W Hampshire	44		44	224		224
Bristol	244		244	485		485
Cambridge	30		30	233		233
Dee Valley	34		34	286		286
Portsmouth	39		39	126		126
South East	390		390	444		444
South Staffs	135		135	248		248
Sutton & East Surrey	102		102	369		369
Veolia Central	366		366	292		292
Veolia East	14		14	193		193
Veolia Southeast	35		35	464		464
WoC total	**1,435**		**1,435**	**329**		**329**
Industry total	**9,588**	**12,540**	**22,128**	**398**	**539**	**937**

Our final price limits include capital expenditure assumptions for England and Wales for the five-year period totalling £22.1 billion. This is higher than the investment included when we last set price limits in 2004. In their final business plans, companies had asked us to include a total of £24 billion. The difference between the two figures relates to our views on efficiency, on the scope and scale of investment, and on how to deal with uncertainty.

Figure 9 shows how the capital expenditure included in our final determinations compares with earlier investment periods. It also shows the capital expenditure included in companies' final business plans.

Figure 9 Actual and projected capital investment 1981-2015



4.2 Capital expenditure incentive scheme (CIS)

The CIS is an important new feature for this price review. It provides strong incentives for companies to put forward challenging and efficient business plans before our determinations and to strive to beat our price limit assumptions after them. The CIS process has also allowed us to give the companies greater certainty about the likely shape of the capital programme at an earlier stage of the price review. As at previous price reviews, we have reviewed and challenged the scope and cost of investment proposals according to different drivers of investment; we set out our approach in this section.

Under the CIS, each company recovers its actual capital expenditure plus or minus an incentive allowance that depends on its forecast of capital expenditure and its actual expenditure in 2010-15. At the next price review, we will reconcile the rewards or penalties due under CIS, taking account of actual capital expenditure along with the expenditure assumptions and additional income allowed in price limits. We will also adjust each company's regulatory capital value (RCV) to reflect actual 2010-15 capital expenditure.

The CIS allows for symmetric treatment of capital expenditure over- and under-spends against the assumptions in our determinations. So, if a company chooses to spend more

than our price limit assumptions, we will reflect actual expenditure in the future RCV. We think that this symmetrical approach decreases risk and we have made our judgements on the cost of capital with this in mind.

4.2.1 CIS ratios

The CIS ratios are the key drivers of the overall CIS incentives. The CIS ratio at industry level for our final determinations is 109 for the water service and 105 for sewerage (based on industry aggregates). For our draft determinations, these ratios were higher at 120 for water and 115 for sewerage and were even higher for the original December 2008 baseline at 128 and 126 respectively. CIS ratios have come down for most companies and we now have a number below 100, with corresponding improvements in CIS incentives. However, a number of companies still have high ratios, some above 130.

Table 27 sets out the CIS ratios for each company based on their final business plans.

Table 27 CIS baseline ratios

Water and sewerage companies	Water	Sewerage	Water only companies	Water
Anglian	105	99	Bournemouth & W Hants	115
Dŵr Cymru	105	106	Bristol	138
Northumbrian	103	101	Cambridge	101
Severn Trent	102	102	Dee Valley	99
South West	105	110	Veolia Southeast	119
Southern	122	112	Portsmouth	108
Thames	125	108	South East	129
United Utilities	94	108	South Staffs	107
Wessex	104	97	Sutton & East Surrey	124
Yorkshire	100*	93	Veolia East	143
			Veolia Central	131

Note:
* Yorkshire Water to absolute decimal accuracy is below 100.

As we set out in December 2008, in calculating CIS ratios we have:

- applied ‘one-sided’ challenges for most of our challenges to company plans, adjusting the expenditure assumption for our baseline only. This increases the CIS ratio; and
- applied ‘two-sided’ challenges where a challenge or exclusion reflects new guidance on regulatory expectations or outputs, or a correction of minor errors. In these cases, we adjust both the company view of expenditure and our baseline assumption, with no net impact on the CIS ratio and resulting incentives.

The movement in CIS ratios reflects a number of factors.

- Improved evidence and justification submitted at a late stage in the process by companies through the draft determination representation process.
- Companies have clarified commitment to verifiable measures of outputs or service improvements, enabling us to include more proposed investment.
- Clarification of some quality requirements from quality regulators following draft determinations.
- We have amended some of our challenges to a two-sided approach following representations.
- Changes to our approach in challenging capital maintenance expenditure.

We have included the CIS matrix in appendix 2. It remains unchanged from that used for the draft baseline in December 2008, and for our draft determinations in July 2009. As for our draft determinations, we have capped the operation of certain aspects of the matrix at a ratio of 130; we explain this in the appendix.

4.2.2 The CIS baseline

Underpinning the ratios is the CIS baseline. This represents our central view of capital expenditure needs for each company, based on the evidence provided to us in:

- companies' business plans;
- cost base submissions;
- the June returns: and
- companies' representations on our draft determinations.

In making our decisions, we have taken account of guidance issued by both Defra and the Welsh Assembly Government. Where appropriate, we have also taken account of the views of other stakeholders, including CCWater, the Environment Agency, DWI, and Natural England. In reaching our view, we have considered each company's proposals carefully and challenged them with the aim of securing the best value for customers. We have also taken into account the views of each company's reporter and the conclusions of the joint consumer research.

In December 2008, we provided each company with our initial view of its capital expenditure needs based on its draft business plan. We also showed companies' business plan expenditure as a percentage of our baseline (the 'CIS ratio'). For example, a CIS ratio of 120 would mean that the company view of expenditure was 20% higher than our baseline. This formed an important reference point for companies' own challenge of their draft business plans in preparing their final business plan submissions.

Tables 28 sets out our industry baseline view for the final determination and links it to the company final business plan baseline.

Table 28 Industry-level CIS baseline

	Total 2010-15	Water service 2010-15	Sewerage service 2010-15
Company final business plan baseline	**(£m)**	**(£m)**	**(£m)**
Gross capex pre-efficiency	25,924	11,544	14,380
Transfers out of capex	-149	-149	0
Two-sided adjustments	-731	-205	-526
Gross capex pre-efficiency post-two-sided adjustments	**25,044**	**11,190**	**13,854**
Company efficiency assumptions (applied to the above)	-1,017	-410	-608
FBP: grants and contributions	-1,072	-533	-539
FBP company view (including adjustments)	**22,955**	**10,247**	**12,708**
Ofwat final baseline	**(£m)**	**(£m)**	**(£m)**
Gross capex pre-efficiency	25,924	11,544	14,380
Transfers out of capex	-149	-149	0
Two-sided adjustments	-731	-205	-526
Gross capex pre-efficiency post-two-sided adjustments	**25,044**	**11,190**	**13,854**
Ofwat adjustments for risk and evidence (one-sided adjustments)	-2,019	-1,245	-774
Ofwat: efficiency assumptions including continuing	-363	4	-367
Ofwat view: grants and contributions	-1,144	-572	-571
Ofwat final baseline	**21,519**	**9,377**	**12,142**
Ofwat final baseline	21,519	9,377	12,142
FBP company view	22,955	10,247	12,708
Company:final baseline ratio	**107**	**109**	**105**

In table 29, we have compared the key price capital expenditure assumptions in the price review process – the final business plans (revised to correct allocation issues, post-final business plan output changes, etc), the draft determination, and the final determination.

Table 29 Comparison between the capital expenditure in the CIS baseline, the price limits and the final business plans

All values post-efficiency and net of grants and contributions. In 2007-08 prices (£m)	Revised final business plan capital expenditure included in CIS	CIS baseline (post efficiency) capital expenditure	Final determinations capital expenditure
Water service			
Capital maintenance	6,974	6,629	6,783
Supply/demand balance	1,865	1,370	1,408
Quality enhancements	1,081	1,107	1,122
Enhanced service levels	327	271	275
Sewerage service			
Capital maintenance	6,124	6,017	6,080
Supply/demand balance	1,537	1,304	1,320
Quality enhancements	3,482	3,392	3,438
Enhanced service levels	974	839	845
Large projects	590	590	602[1]
Total – water and sewerage	22,955	21,519	21,872

Note:

1. In addition the final determination capital expenditure includes £256m associated with the Thames tunnel which is considered outside the CIS.

Our final determinations baseline is £2.3 billion higher than the position at draft determinations. The movement reflects an increase:

- in capital maintenance of £580 million in water and £440 million in sewerage, reflecting the inclusion of more exceptional outputs, and changes to our AMA;
- of £590 million associated with the inclusion of the Lee tunnel in the CIS for our final determinations, under Thames' sewerage quality programme;
- of £240 million driven by improved information on supply/demand balance needs with the inclusion of extra outputs (including some allocation of sewer flooding expenditure), and reduction to some of our cost challenges;
- of £200 million in enhanced service levels, driven primarily by the inclusion of further sewer flooding outputs; and
- of £260 million in quality enhancements, driven by further outputs on SEMD and trunk mains refurbishments in the water service, with inclusion of further NEP outputs in the sewerage service.

4.2.3 Decisions on capital expenditure

Our CIS baseline is founded in the key concept of a central estimate based on a balanced view of risk and efficiency. In setting the baseline and challenging the capital programmes that companies proposed, we have adopted common principles for all cost categories, as set out in table 30.

Table 30 Central estimates

A central estimate represents:	How we derived a central estimate
A balanced representative view of efficiency	We used the cost base comparative tool to challenge the pricing of forecast expenditure. We adjusted expenditure forecasts to an achievable level of efficiency for a middle-ranking company. We based this on a median or representative level of current efficiency, as evidenced through the cost base submissions, adjusted for the future efficiency that we could expect from an average performing company. In adjusting for efficiency, we also took account of evidence on the consistency between cost base and business plan cost estimates.
A balanced view of risk	We reviewed the approach each company has taken on risk, in planning investment in both base service and enhancement. We applied challenges where appropriate.
A well-evidenced forecast expenditure which relates to justified outputs	All outputs must be justified using CBA, sound asset management planning, with expenditure justified and related to outputs. We used the capital estimating scorecard and other evidence to guide challenges to poorly evidenced cost estimates.

In most cases, we used the approach to challenging the costs of delivery from price reviews. This has four key principles.

- **Need –** is there a need for, or customer benefit derived from, the proposed investment?
- **Solution –** has the company demonstrated that its proposal represents the best way of meeting the identified need?
- **Cost –** has the company accurately costed the proposed investment?
- **Efficiency –** what is the evidence on the company's relative efficiency (through the cost base tool)?

Our challenges fall into the following main groups.

- **Remove proposed investment –** if the company has not demonstrated that a need (or customer benefit) exists (for example, we have challenged proposed improvements in service not supported by cost benefit or willingness to pay evidence).

- **Adjust the scale of proposed investment –** if we accept there is a need for investment, but we have only partially accepted the company's case on the scale of need (for example, we have challenged some companies' forecasts of new sewer flooding problems, or required sewage treatment capacity increments).

- **Challenges based on strength of justification –** if we accept the need for investment, but do not consider that the proposed investment is fully evidenced or sufficiently developed to embody a balanced approach to risk.

- **Costing related challenges –** if we have specific evidence that costings that the companies put forward are not robustly justified.

- **Efficiency –** symmetrical adjustments reflecting our view of a company's relative efficiency in delivery of capital programmes, with a further continuing efficiency assumption.

Our assumptions around capital expenditure profiling are based on the profiles that the companies submitted as part of their final business plans. We have chosen not to adjust the shape of these expenditure profiles for our final determinations. We asked companies to review the expenditure profiles in light of our draft determinations and propose re-profiled expenditure levels that would allow them to deliver their capital programmes efficiently and effectively while smoothing the demand for delivery resources within the period. However, companies did not suggest any options for reprofiling in their representations on our draft determinations.

4.3 Capital maintenance investment

Capital maintenance expenditure represents the largest element of the proposed capital programme at nearly 60% of capital expenditure in the CIS baseline and a similar proportion of the investment that companies proposed in their final business plan submissions. Price limits include almost £13 billion of expenditure for capital maintenance – an increase of 21% (£2.2 billion) compared with what we allowed at the last price review.

In setting our assumption for capital maintenance expenditure requirements for 2010-15, we assessed the evidence presented in the companies' final business plans following the approach we set out in our methodology paper.

4.3.1 Asset management assessment (AMA)

We first implemented our AMA approach to assessing capital maintenance expenditure when we set the draft baseline in December 2008. We explained our approach in PR09/23, 'Asset management assessment (AMA) and baseline setting' (January 2009). We then provided further information in PR09/32, 'Capital maintenance and asset management assessments (AMA) for draft determinations – technical note' (August 2009). Our approach is based on the asset management plan assessment process (AMPAP), developed jointly with the water industry in light of experience from the last price review. The criteria for our assessment fall into the main asset management planning areas of:

- stakeholder engagement;
- governance, policy and strategy;
- systems, processes, data and analysis; and

- achieving an optimum balance of risk to service and costs.

We have used a symmetrical approach that creates incentives for companies to provide robustly justified plans that are proportionate to proposals for increased activity and costs. The approach also allows us to challenge historic levels of activity and expenditure where this is appropriate. We have used the company expenditure proposals for 2010-25 and the five years of actual and predicted expenditure for 2005-10 as the starting point for our analysis. This takes account of the most recent evidence on expenditure trends and growth in the asset base. It is, however, only a starting point to the analysis from which we assess planned increases or reductions.

We expected companies to have developed their proposals for capital maintenance within the context set by their SDS. We looked to the business plans to demonstrate a robust risk-based derivation of an economic level of capital maintenance for 2010-15 and beyond. We have challenged companies' proposals if they have been unable to demonstrate that increasing activity is needed to secure levels of service or that customer support justifies the increased costs.

Our AMA for companies' final business plans is a full assessment of the technical and managerial processes applied in developing their capital maintenance business plan submissions. It takes into account both the quality of the technical data and the processes applied, and the quality of the decisions made. This allows us to produce an overall 'AMA score' from a figure for each sub-service.

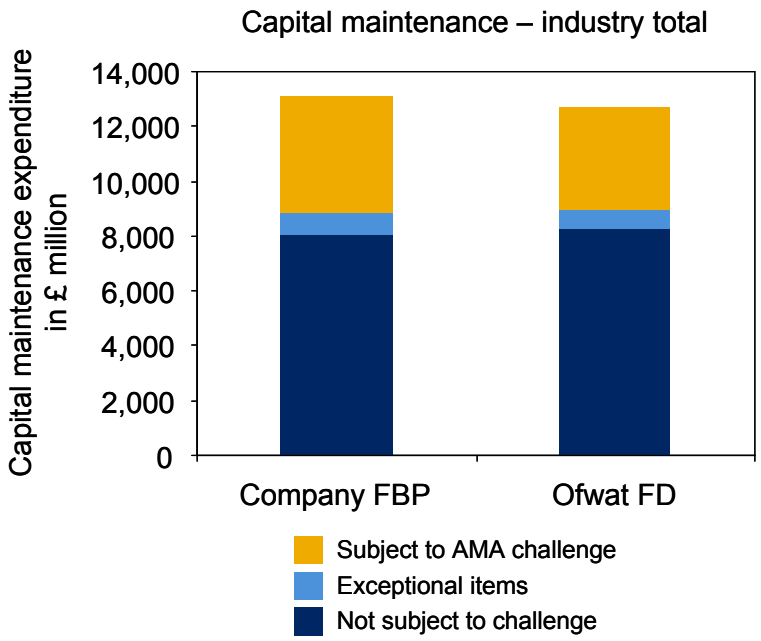
For our final determinations, we have placed emphasis on:

- how companies have balanced the competing pressures for maintaining a stable profile of risk to service and serviceability;
- the upward pressure on prices; and
- the need to deliver good value to customers.

The AMA score does not just reflect a technical application of asset management planning principles, but our overall assessment of the appropriateness of and confidence in the plan for capital maintenance as a whole.

Figure 10 shows the total industry level of capital maintenance expenditure and illustrates the principle components in our assumptions for price limits. These figures are net of companies' and our assumptions for capital efficiency. We explain our assumptions in section 4.10.4.

Figure 10 Total capital maintenance expenditure (post efficiency)



Our AMA approach does not automatically challenge all proposed maintenance expenditure. It is clear that a substantial proportion of activity needs to continue into the next period in order to maintain the capability of assets to continue to deliver services to consumers.

Many companies have demonstrated that the levels of recent activity and expenditure are a sound basis for the future. This can be seen from each company's output performance and the robustness of its planning approach for the future. However, in some cases the evidence was less convincing.

If companies have proposed increases in expenditure, we have challenged adjustments for our price limit assumptions using the AMA assessment. In other cases, companies have proposed reduced activity and expenditure. Here, the AMA approach allows us to provide companies with incentives to maintain services at lower cost.

We applied the AMA challenge to about £4.2 billion of the proposed total capital maintenance programme, with exceptional expenditure items (see section 4.3.3) representing about £800 million of proposed expenditure.

By sub-service, the capital maintenance investment included within our baseline assessments are set out below.

- For water infrastructure investment we have assumed an increase in expenditure of more than £800 million, up 36% compared with that assumed at the 2004 price review. This reflects consolidation of work on water distribution assets driven by

water quality and leakage considerations within capital maintenance. Also included is £200 million of investment for improvements in the consumer acceptability of water that aims to reduce the number of incidents of discoloured water.

- Water non-infrastructure investment expenditure has increased by more than £560 million, up 19% compared with that allowed at the 2004 price review. This focuses on maintaining the water quality compliance benefits achieved through past price reviews as well as funding the first time replacement of domestic meters originally installed during the mid-1990s.

- Sewerage infrastructure investment has seen an increase of more than £140 million, up 11% compared with that allowed at the 2004 price review. This focuses on maintaining improvements in service benefits for sewer flooding.

- Sewerage non-infrastructure expenditure has increased by more than £670 million, up 17% compared with that allowed at the 2004 price review. This focuses on maintaining the environmental compliance benefits achieved through past price reviews.

The overall capital maintenance increase of 21% uplift for 2010-15 builds on the 22% uplift increase we assumed at the last price review. Capital maintenance submissions have improved both in terms of the quality of evidence presented and in terms of the application of planning approaches applied through the capital maintenance planning common framework (CMPCF).

This means that in the last two price reviews, we have seen overall increases in capital maintenance expenditure of nearly 50% compared with the 2000-05 level. We recognise the need for such increases to maintain services to customers and to consolidate the benefits from previous improvement programmes. However, we must question whether we are now approaching a sustainable level of capital maintenance for the future. We recognise that the industry as a whole has improved its understanding of asset behaviour and investment needs and that the common framework approach has served the sector well, contributing to a much-improved understanding of investment needs.

As we look forward to the setting price limits in the future, we see a need to reappraise the common framework approach and develop potential improvements, particularly in the areas of risk management, programme optimisation and the balancing of service benefits. In particular, it is important that companies improve their understanding of the benefits derived from investments already delivered in order to inform future decision processes. We see a considerable difference across the industry in the unit costs of delivery of each sub-service (particularly in the areas of water infrastructure and sewerage non-infrastructure). It is unclear from current analysis whether these differences are driven by genuine asset needs or through differences of efficiency and effectiveness.

At the same time, we want to ensure that efficient and effective companies are recognised and rewarded through the price setting mechanism, while incentives are in place to encourage all companies to improve their asset management and service delivery.

We will continue to work closely with the industry before the next price review framework is implemented to develop both the common framework and the AMA approach in a timely, open and transparent way.

4.3.2 The AMA approach

We have reviewed and, where appropriate, developed the AMA approach to respond to issues identified during the price setting process. We have also taken account of emerging issues to better understand companies' expenditure and output proposals outlined in their final business plans and in their representations on our draft determinations.

We have considered carefully the issues that companies and other stakeholders have raised in relation to the AMA challenge process. For our final determinations, we have responded to these by reverting to the incentive-based calculation that we used when we set the draft CIS baseline in December 2008. We have removed the mechanism that, for our draft determinations, exposed a minimum of 25% of capital maintenance plans to an AMA challenge. This mechanism could be seen to distort incentives for those companies that had challenged themselves to contain future expenditure increases.

The additional incentive allows a company to gain recognition of additional expenditure within their baseline assessment (which depends in part on the AMA score achieved) if its proposed expenditure levels are lower than historic levels. Across all of the AMA assessed sub-services, 16 out of 62 assessments resulted in our view of the baseline capital maintenance expenditure being higher than the companies' assessment (before efficiencies were applied).

The AMA score has a range from 0 to 5 and is applied to each capital maintenance sub-service. We judged that a score of 4 out of 5 would represent a fully justified plan. Such plans would be included at 100% of all the proposed expenditure within the CIS baseline assessment. Correspondingly, scores higher than 4 would receive a greater recognition of the expenditure within the CIS baseline up to a maximum of 25% more. A score of 2 or less would indicate that a company has, in its business plan, demonstrated poor procedures and application of asset management practice, causing us to doubt the company's ability to effectively deliver within the current levels of expenditure.

Table 31 gives an overview of the range of scores we have determined across the industry and how this range translates into the AMA adjustment (or 'challenge') we have applied for our final determinations. As a result of company representations AMA scores have increased on average by between 0.17 and 0.31 in each sub-service area.

Table 32 shows the AMA scores, at sub-service level, achieved by each company. We will publish a more detailed technical overview analysis of the AMA application and its outcomes following our final determinations.

Table 31 Industry AMA scores (at sub-service level) and AMA challenge applied

		Water infrastructure	Water non-infrastructure	Sewerage infrastructure	Sewerage non-infrastructure
AMA score (4=100%)	Max	3.8	3.7	3.6	3.6
	Average	3.5	3.3	3.4	3.2
	Min	2.7	2.6	3.0	2.6
AMA challenge applied	Max	32%	35%	24%	34%
	Average	14%	18%	16%	19%
	Min	5%	7%	9%	10%

Table 32 AMA sub-service scores by company

	Water infrastructure	Water non-infrastructure	Sewerage infrastructure	Sewerage non-infrastructure
Water and sewerage companies				
Anglian	3.6	3.4	3.5	3.4
Dŵr Cymru	3.3	2.8	3.1	3.0
United Utilities	3.4	3.4	3.1	3.5
Northumbrian	3.1	3.0	3.5	3.0
Severn Trent	3.7	3.6	3.3	3.6
South West	3.4	3.0	3.5	3.0
Southern	2.7	2.6	3.0	2.6
Thames	3.5	3.3	3.3	3.3
Wessex	3.5	3.1	3.6	3.1
Yorkshire	3.7	3.6	3.5	3.6
Water only companies				
Bournemouth & W Hampshire	3.4	3.5		
Bristol	3.1	3.0		
Cambridge	3.8	3.7		
Dee Valley	3.8	3.6		
Portsmouth	3.7	3.4		
South East	3.1	3.2		
South Staffs	3.6	3.6		
Sutton & East Surrey	3.7	3.3		
Veolia Central	3.5	3.0		
Veolia East	3.6	3.6		
Veolia Southeast	3.5	3.2		
Average	**3.5**	**3.3**	**3.4**	**3.2**

4.3.3 Exceptional items

We have used the AMA approach to assess most of the capital maintenance expenditure. For the remainder, we have identified ‘exceptional items’, which are independently assessed. An exceptional item is one where either:

- the expenditure is unusual; or
- there is a discrete output in addition to serviceability parameters.

We have reviewed exceptional items separately, based on the particular characteristics of those proposals (for example, we have assessed meter renewal proposals as exceptional items across the industry, aligning our judgements with those for new meters assessed as part of supply/demand balance proposals). For some companies, we have treated maintenance on dams and large diameter trunk mains as exceptional because of their high consequence, but low likelihood and uneven nature of expenditure in comparison with past overall expenditure levels.

Many companies have promoted schemes to improve the consumer acceptability of drinking water either as an improvement in drinking water quality or as an improvement in service levels. We have taken the view that these schemes should not be viewed under either of these investment drivers, as they did not relate directly to changes in water quality legislation or demonstrate distinct improvements in service that were supported by consumer willingness to pay.

So, we have considered all drinking water consumer acceptability schemes as capital maintenance expenditure and have assessed them alongside the obligation to maintain service as part of each company's Distribution Operational Maintenance Strategies (DOMS). This has for contributed to the increase in capital maintenance expenditure for the companies concerned. We have assessed these schemes either as:

- exceptional items, and stated a defined output, or, in some cases;
- as part of the expenditure assessed within the AMA process where the output for consumers was not stated or was a material improvement.

4.3.4 Transfers between capital and operating expenditure

From our analysis of companies' final business plans, it was clear that some were misinterpreting the regulatory accounting guidelines on water and sewerage infrastructure accounting. In particular, this affected operating and capital infrastructure renewals expenditure (IRE).

For draft price limits, we reallocated water service IRE to operating expenditure to correct for this for seven companies. Some companies provided additional evidence on their approach in their representations. As a result we removed this reallocation for two companies and reduced the value of the reallocation for a further two companies. We set out more detail on our assessment of relative efficiency in section 4.10.2.

At draft determinations, our primary area of concern related to water infrastructure expenditure for proactive mains repairs associated with leakage. We were concerned about evidence of possible significant changes in the level of capitalisation of costs for other components for both water and sewerage.

Having reviewed these areas for all companies since our draft determinations, we have concluded that we should make no further adjustments for our final determinations. However, as part of our accounting separation work we will be requiring companies to set out their capitalisation policies clearly, which will enable us to understand this area better. We published our requirements for this in 'Accounting separation June return reporting requirements 2009-10' (October 2009).

4.4 Expenditure to maintain and improve the supply/demand balance

Table 33 summarises the expenditure we included in the CIS baseline to maintain the balance between supply and demand.

Table 33 Expenditure to maintain the balance between supply and demand

£ million (post-efficiency)	CIS baseline capital expenditure 2010-15	Additional operating expenditure by 2014-15
Water service		
Supply/demand balance (infrastructure)	957	
Supply/demand balance (non-infra)	861	
Sub-total – water service	1,818	32
Capital contributions[1]	(448)	
Net expenditure	1,370	
Sewerage service		
Supply/demand balance (infrastructure)	806	
Supply/demand balance (non-infra)	931	
Sub-total – sewerage	1,736	26
Capital contributions[1]	(433)	
Net expenditure	1,304	
Total supply/demand expenditure	**2,674**	**58**

Notes:

1. 'Capital contributions' includes receipts from infrastructure charges, developer contributions, compensation and requisition charges.
2. Totals may not add because of rounding.

In their proposals to maintain and improve the supply/demand balance, we expected companies to:

- demonstrate any need to invest to deliver the service that customers want;
- base its proposals on a thorough, integrated option appraisal, taking a broad view of the costs and benefits over the long term, consistent with their water resource management plans; and
- form a reasonable view of the costs of the preferred solution, taking into account the best available evidence, including its own recent experience.

We set out our approach to specific expenditure assumptions below.

4.4.1 Climate change and water resources

In PR09/27, 'Climate change and water resources' (February 2009), we said that we would include significant climate change-driven investment in water resources in the final CIS baseline only if it were based on robust evidence using UKCP09 scenario analysis. UKCIP published the latest scenarios in June 2009, two months after companies submitted their final business plans.

UKCP09 contains extensive data on climate change scenarios and probability assessments. Analysing this data, and identifying its implications for companies' investment plans, is a major task and it would have been unrealistic to expect the companies to complete this work and for us to take action before final determinations. So, our determinations do not take account of proposals for significant expenditure to address the impact of climate change on the balance between water supply and demand.

Companies' business plans used the outdated UKCP02 scenario analysis to measure the impact of climate change and suggested a need to invest about £1.5 billion in the period up to 2015 to address the effects of climate change on water supply and demand. Using UKCP09 scenario analysis, companies' investment requirements could be greater or less than this amount.

If companies can establish clearly and robustly that they need to invest by 2015 to address the impact of climate change, we want them to be able to do so without delay in order to maintain security of supply for consumers. On that basis, we have allowed a notified item relating to changes in water supply/demand balance arising out of the use of UKCP09. As long as companies follow the requirements of the notified item, we will take into account in an interim deterioration any material expenditure they require during 2010-15 to deal with the impact of climate change on water resources (see section 5.3).

4.4.2 Metering

We have assumed that companies will spend £470 million (post efficiency) to install 2.4 million meters over 2010-15. We have accepted most companies' projections for optional meters, challenging a minority that had failed to explain satisfactorily why their forecasts exceeded historical trends.

Companies also proposed additional metering either on change of occupier or a compulsory basis. We accepted proposals, either in full or in part, from 13 of the 17 companies that planned additional metering. On our assumptions, about 50% of households will have a meter by 2014-15, up from 37% in 2010. The largest increase will be in areas of serious water stress, where the proportion will climb to about 57% by 2014-15.

We applied a unit cost challenge to all metering proposals. We capped the capital expenditure unit costs of a company's proposals at the average that the company had experienced over the three-year period 2005-08, unless the company could justify a higher unit cost. We capped the operating expenditure unit costs at the value contained in the targets that we set for each company to maintain a balance between metered and unmetered charges.

We expected companies that proposed additional metering programmes, on top of their optional metering programmes, to demonstrate that their plans formed part of a best value approach to balancing water supply and demand. If there was no supply/demand deficit to address, we expected companies to demonstrate that the long-term benefits of their proposals outweighed the costs. We set out our approach to assessing metering in PR09/20.

None of the companies was able to demonstrate that the quantified benefits exceeded the costs. However, some were able to demonstrate that the gap between quantified costs and benefits was relatively small, leaving a reasonable prospect that unquantified benefits might bridge that gap. So, we accepted companies' proposals in these cases.

We took a balanced approach in reviewing companies' CBA. For example, we made compensating adjustments if we thought that companies had overstated or understated their costs and benefits. We rejected proposals in full or in part from some companies because we disagreed with their CBA. We rejected proposals from two companies because they accepted that they were unable to demonstrate that metering would be cost-beneficial.

4.4.3 Leakage and water efficiency

We have accepted most companies' proposals to maintain existing levels of leakage, or to reduce leakage slightly. In some cases, we have challenged companies to reduce leakage by more than they proposed, while in others our analysis suggests that more modest leakage activity would provide a better value outcome for consumers. Overall, we have assumed that leakage will fall by about 3% compared with current levels.

We did not include any additional expenditure for activity to meet base service water efficiency targets. However, we have included expenditure for six companies to deliver enhanced water efficiency projects.

4.4.4 Planning for the future

In general, we think that planning is part of each company's ongoing business, so the costs of this activity should already be part of base expenditure. We have included expenditure for research projects where there is a reasonable prospect that companies need it in 2010-15 to contribute to resolving a future supply/demand deficit, but only

where it is not part of the company's ongoing business. We have excluded expenditure for contingency planning, which we consider is part of general business risk.

4.4.5 Sustainability reductions

We have included expenditure to address reductions in water abstraction driven by the Habitats Directive, unless a company is seeking compensation for the changes to its abstraction licence(s). We have not included any expenditure to address reductions driven by non-Habitats Directive requirements. In line with the policy agreed with Defra and the Environment Agency, companies should finance such schemes through the Environment Agency managed compensation scheme.

4.4.6 Water supply network reinforcement

Several companies planned to reinforce their water supply networks to maintain levels of service while distributing greater volumes of water. We included justified expenditure for this purpose, taking into account the company's case, along with the views of its reporter. We excluded expenditure that the company did not justify and its reporter did not support. In addition, we made an adjustment where there was only partial support. In cases where the available evidence supported a partial adjustment, but with no clear view as to scale, we reduced the expenditure by 25%. Unless there was a clear reason to do otherwise, we allocated 75% of network reinforcement expenditure to new development.

4.4.7 New development – water and sewerage

Companies' plans allowed for a greater number of new water and sewerage connections over this review period than they experienced between 2004-05 and 2009-10. We accepted most companies' assumptions about new connections, but we have challenged their unit costs. As for metering, we have assumed that future unit costs should normally be no greater than historic unit costs. As a result, our challenge capped the capital costs for each connection at the average costs that the company experienced over the three years 2005-06 to 2007-08, unless the company provided robust justification for greater costs in the future.

In their representations on our draft determinations, some companies argued that our cap on new development operating expenditure double-counted our cost base efficiency adjustment. This is because both challenges compared individual company costs with industry average values. We have accepted this point and have revised our cost challenge. We have also capped companies' new development unit operating costs at their proposed level less any reduction we applied to their unit operating costs for optional metering. We did this on the basis that new development operating expenditure encompasses the additional costs associated with operating a metered account, so any challenge that applies to the latter should also apply to the former.

This was a conservative challenge, which effectively accepted the remaining components of companies' proposed new development operating expenditure. In cases where companies' costs still seemed excessive, therefore, we applied an alternative challenge. This capped a company's proposed costs at one and a half times the industry average. We do not think that this alternative cost cap double counts our efficiency challenge. Even after applying this new cap, companies' costs are higher than the industry average. In effect, our cap challenges excess scope, while our efficiency assumptions challenge delivery efficiency.

We expect companies to recover from developers a reasonable proportion of the costs of new development in line with their legal entitlement. We have compared the proportion of new development expenditure that companies recover from developers through enhancement requisitions, grants and contributions, with the proportion they recovered over the three years from 2005 to 2008 (excluding connection charges and the costs recovered by those charges). We know that some companies also report contributions towards new development costs as revenue from rechargeable works, so we have included this revenue in our comparison.

We have assumed that the proportion of new development costs that companies will recover in total from requisitions and – where applicable – revenue (rechargeable works) will be the greater of:

- the proportion that the company proposed for 2010-15;
- the proportion that the company recovered over the three years 2005-06 to 2007-08, capped at 100%; or
- 50% of the gap between the historical value calculated above and the industry average over the 2005-06 to 2007-08 period.

We checked whether companies had explained why the proportion of new development costs they expected to recover in the future would differ from the proportion they recovered in the past, so that we could adjust our challenge if appropriate. We applied the adjusted recovery rate to new development capital expenditure after taking account of efficiency assumptions. We increased companies' projections for annual infrastructure charge revenue to reflect the maximum infrastructure charge for each property.

4.4.8 Operating expenditure for 2009-10 – water and sewerage

We treated supply/demand operating expenditure (excluding new development and metering) as a discrete item. We capped the 2009-10 supply/demand operating expenditure to be the same incremental amount assumed at the last price review instead of rolling forward the actual figure for 2008-09 or using the company business plan forecast.

We assessed operating expenditure separately for metering and new development, calculating the cap for those items using the unit cost assumptions that we made at the

last price review, and applying those unit costs to companies' estimates of meter and new connection numbers in 2009-10.

4.4.9 Wastewater planning expenditure

For wastewater planning, we expected companies to:

- take a central estimate of the future supply/demand position;
- consider all feasible options; and
- select the best value solution for consumers.

We recognise that this is difficult. The small sizes of sewerage catchments mean that planned development may not occur in the particular catchments companies originally expected at the outset. This means that companies then have to change their own plans accordingly. UK Water Industry Research's (UKWIR) long-term least cost planning for wastewater supply/demand provides a methodology to focus companies' plans on those areas of greatest risk, and we assessed each company's plan against this framework.

4.4.10 Sewage treatment capacity

Overall, companies plan to expand sewage treatment capacity, measured in population equivalent (PE) terms, by more than the forecast increase in population. At an industry level, we have accepted the case for this, but we have challenged individual company proposals.

Taking a balanced view of risk, we have assumed that a company will increase PE treatment capacity at the same rate that the population grows. In order to justify increasing capacity at a faster rate a company needed to provide evidence that:

- there was currently insufficient headroom;
- there would be migration within its supply area leading to increasing headroom at some works; or
- it would be more cost effective in the long term to increase capacity further.

For each company, we have limited the increase in capacity to the projected increase in population unless the company demonstrated why it needed a larger capacity expansion.

Some companies planned to increase capacity at a slower rate than the projected increase in population. We have accepted these companies' plans if we think that they can accommodate population growth within existing capacity and/or if declining industrial discharges are likely to reduce the demands on their capacity. Where such companies are simply taking a deliberately riskier approach, we have increased their expenditure by an amount sufficient to finance additional PE sewage treatment capacity at 75% of

population growth. We have not increased this to 100% because these companies may have a greater amount of spare capacity than is typical in the industry.

4.4.11 Sewage treatment unit costs

We accept that the unit costs of enhancing sewage treatment capacity will vary because of company-specific factors. However, we think that there is a limit to how great this variance should be. We have compared the unit cost of enhancing PE treatment capacity for three categories of sewage treatment works:

- less than 1,500 PE;
- greater than 1,500 PE, but less than 10,000 PE; and
- greater than 10,000 PE.

We used these categories in the 2004 price review, and the information that companies provided in their final business plans confirmed that they remain appropriate.

We have compared the unit cost of the investment that each company proposed for each category with the costs that the rest of the industry proposed. We did not think that the evidence the companies provided showed that costs should necessarily vary significantly. However, if a company conducted robust site-specific option appraisal, we allowed unit costs to vary from the rest of the industry by up to 50%.

We think that this level of variance is sufficient to reflect company-specific factors. If a company calculated costs on a site-specific basis, but did not demonstrate that it had selected a best value plan, we only allowed unit costs to vary by up to 25%. If a company calculated costs for sewage treatment on some other basis, we considered that its plan was not mature, so we capped the unit cost for each category at the average unit cost for the industry.

In their final business plans, we asked companies to separate out the costs of enhancing PE capacity at sewage treatment works from other treatment costs, such as increasing hydraulic capacity. Since these costs are associated with the same projects, we have judged that high unit costs for PE capacity are likely to indicate that other costs are similarly high. We have therefore applied the cost challenge to all treatment costs.

We applied a similar test to operating costs. We have not seen any evidence to suggest that operating costs vary significantly between different sizes of treatment works. We have therefore compared unit costs in 2014-15 for all fully operational treatment works. We have reduced the additional operating costs in the same proportions as described above for capital costs. We applied the reductions to all additional operating expenditure for sewage treatment works for 2010-15.

4.5 Expenditure to improve drinking water and environmental quality

Companies proposed investment of £1.4 billion for drinking water improvements and £4.1 billion for improvements to environmental quality. The CIS baseline allows for investment of £1.1 billion investment on drinking water and £3.4 billion on environmental quality.

We have challenged schemes that were poorly scoped, or lacked clear outputs or statutory drivers. We have done this within the context of comprehensive and clear guidance from Defra, the Welsh Assembly Government, and the quality regulators.

Our challenges are informed by the CBA that companies carried out, particularly in relation to the links made with customers' willingness to pay. We have not automatically excluded or adjusted non-cost beneficial statutory schemes, but we have used the results to indicate where we needed to look more closely at a proposed scheme. We have also used CBA to inform our decisions on proposals for discretionary investment (that is, investment without a statutory basis). Throughout the process, we have worked with the relevant quality regulator to improve our understanding of the basis for, and the interpretation of, the relevant legal obligation.

Our challenges took a number of forms, depending on the strength of the company's case (including the reporter's comments) and the views of the quality regulators. These can include specific cost challenges where the scope of a scheme had not been fully worked out or supporting evidence was lacking, through to complete exclusion where we were not convinced a case exists (for example, where there are two schemes intending to produce the same output, or where the scheme should have been completed in 2005-10). We have also capped costs, or challenged unit costs and timing where appropriate in our CIS baseline. In some cases, we have excluded schemes on a two-sided basis (as set out in section 4.2).

Tables 34 and 35 below show the capital expenditure (after efficiency assumptions), analysed by driver, to improve drinking water and environmental quality included in the CIS baseline.

Table 34 Expenditure under the drinking water quality, environmental and other obligations (post-efficiency)

	Capital expenditure 2010-15 (£m)	Additional operating expenditure by 2014-15 (£m)
Water treatment		
Nitrate removal – to reduce high nitrate levels caused by diffuse pollution present in sources of water used for the drinking water supply	70	1.2
Plumbosolvency control – conditioning of the water supply so it dissolves less lead from companies' and customers' pipework	7	0.5
Trihalomethane reduction – changes to company assets to reduce the level of by-products of disinfection to comply with water quality regulations	37	0.4
Turbidity reduction – to improve the clarity of the water supply	5	0.0*
Cryptosporidium risk reduction – required measures to companies' assets to reduce contamination from cryptosporidium	89	2.0
Pesticide removal – to reduce pesticides levels present in sources of water used for the drinking water supply	42	0.8
Other – other work supported by DWI at water treatment works	88	1.3
Water distribution		
Lead communication pipe replacement – replace companies' pipework, where necessary to help meet lead standards at customers' taps	100	0.2
Other obligations		
Schemes to improve acceptability of drinking water to consumers – for example, colour, taste, odour	171	0.0*
Security and Emergency Measures Direction – schemes to protect assets and maintain supplies during emergencies	369	3.8
Water quality monitoring investigations	7	0.6
Miscellaneous	12	0.2
Environmental obligations		
Habitats and Birds – compliance with EU Directives through reducing water abstraction affecting valuable nature conservation sites and threatened species	47	0.3
Countryside and Rights of Way Act 2000 – reducing water abstraction affecting sites of special scientific interest	7	0.1
UK Biodiversity Action Plan – reducing water abstraction to further the conservation of biodiversity	24	0.0*
Water Framework Directive – schemes to implement river basin management plans to be approved by UK Ministers in order to meet EU WFD requirements	12	0.3
Local priority – changes to water abstraction of significant local importance	7	0.0*
Sub-total – new work identified for 2010-15	**1,094**	**11.5**

Interaction with 2005-10 quality programme		
Projects from 2005-10 to be completed in 2010-15	14	0.1
Programme for drinking water, environmental and other obligations	**1,107**	**11.5**

Notes:
* Figures shown as £0.0m because of rounding.
Totals may not add because of rounding.

Table 35 Expenditure under the environmental quality programme (post-efficiency)

	Capital expenditure 2010-15 (£m)	Additional operating expenditure by 2014-15 (£m)
Compliance with EU directives		
Urban Waste Water Treatment – upgrades to sewage treatment works to produce cleaner discharges to the environment	547	15.3
Unsatisfactory intermittent discharges – to limit pollution from combined sewer overflows, emergency overflows and storm tanks	985	11.0
Groundwater – investigations and improvements to treated effluents and intermittent discharges which may affect groundwater	104	1.9
Freshwater Fish – reduction in levels of pollutants, principally ammonia in discharges from sewage treatment works to allow more favourable habitats for fish	379	7.8
Bathing Waters Directives – investigating and improving sewage treatment works and overflows to assist compliance with EU microbiological standards	220	2.7
Shellfish Waters – reduction of microbiological pollution to ensure a suitable environment for shellfish	86	3.0
Habitats – improvements in quality of discharges to safeguard valuable nature conservation sites and threatened species	108	2.5
Water Framework Directive – schemes and investigations in accordance with the river basin management plans to be approved by UK Ministers in order to meet WFD requirements. Typically covers objectives for ammonia, phosphorus, biochemical oxygen demand and dissolved oxygen standards in rivers and discharges to groundwater	78	2.4
Water Framework Directive (Chemicals) – investigations to quantify risk from chemicals, assess catchment sources and assess treatment options	42	Nil
National legislation and policy initiatives		
Countryside and Rights of Way Act – investigations and improvements to the quality of water affecting sites of special scientific interest (SSSIs)	20	0.2
Biodiversity Action Plan – water quality improvements and studies to meet conservation targets under the UK Biodiversity Action Plan	6	nil

First-time sewerage – connecting properties to the public sewerage system to address actual or potential environmental or amenity problems caused by the existing drainage arrangements	139	1.6
Local priority – improvement schemes and studies that are of significant local importance	46	2.4
Environmental Permitting Regulations – schemes to provide first time combined heat and power (CHP) or pollution prevention measures	45	1.2
Sewage sludge management – schemes to address the impact of extending designations of nitrate vulnerable zones	116	0.8
Sustain planned level of environmental protection – improvements needed to ensure continued achievement of standards established at previous price reviews (for example, dealing with misconnections)	1	0.2
Discharge flow limit increases – schemes identified to ensure no deterioration in the current classification of water as a result of increased volumes of sewage	238	3.3
Security and Emergency Measures Direction – schemes to protect assets and assessments of further improvements needed beyond 2015.	28	0.2
Sub-total – new work identified for 2010-15	**3,185**	**56.5**
Other, including interaction with 2005-10 quality programme	207	1.7
Quality programme for the sewerage service	**3,392**	**58.1**

Note:
Capital and operating expenditure totals might not add because of rounding.

Our final price limits do not include those Water Framework Directive schemes that we judge Ministers may exclude on the grounds of disproportionate cost (see section 3.2.12). Ministers will not make final decisions on the river basin management plans for 2010-15 until December 2009. Affected companies will therefore be able to use the established mechanisms set out in the AMP5 change protocol (see section 5.3) in the event of any changes to statutory obligations that we are unable to reflect in price limits. Ministers will also confirm the final version of the NEP after we have set price limits. Companies will be able to deal with any resulting changes to investment requirements in the same way.

4.5.2 Lead in drinking water

Table 29 sets out the costs we have allowed to deal with lead problems. Our approach to this has been to continue to support plumbosolvency treatment and targeted replacement of company-owned lead communication pipes in high-risk zones, along with schemes to provide advice to customers on lead pipes. However, we have not assumed any additional (capital or operating) expenditure in price limits to replace privately-owned lead pipes (see section 3.2.11). This would represent a cross-subsidy from customers who have already paid to have their lead pipes replaced. However, we are content for companies to offer the replacement of customer pipes on a rechargeable basis where this is necessary to protect public health.

In response to representations on our draft determinations, we have excluded proposed expenditure on customer owned pipes on a two-sided basis – that is, without affecting the CIS baseline.

4.5.3 Security and Emergency Measures Direction

We have considered a number of proposals for investment relating to the Security and Emergency Measures Direction in both the drinking water and sewerage areas. We have made assumptions having discussed the schemes and costs, and particularly the phasing of work, with the relevant government authorities.

4.5.4 Catchment management

As we have explained in chapter 3, price limits include the catchment management schemes and investigations that companies proposed in their final business plans. Some of these are subject to cost adjustments, for example, where we believe companies could have done more to obtain contributions from others who will directly benefit from the work.

4.5.5 Sewage sludge management

Water and sewerage companies proposed approximately £1.5 billion of expenditure to manage the treatment and disposal of sewage sludge allocated across capital maintenance and enhancement drivers. Price limits include approximately 84% of this expenditure following challenges on:

- scope;
- estimations of growth;
- cost benefit; and
- scheme costs.

Capital maintenance expenditure allowed was also subject to the AMA challenge discussed in section 4.3.

4.6 Resilience

Most companies have proposed investment to increase their resilience of their services to external hazards. This is important because customers increasingly expect companies to provide water and sewerage services in almost all circumstances. We assess companies' resilience proposals using the following criteria.

- Why is the current level of risk to service unacceptable?
- Is the proposed new level of risk to service clear and justified?
- Are the benefits expressed in terms of consumer service?

- Have a number of options been considered and subjected to robust CBA?
- Have the impacts of climate change been considered?

We also expected to see clearly sustainable plans that were consistent with the long-term aspects of companies' overall strategic aims. We set out our approach to resilience in PR09/12, 'Asset resilience to flood hazards: development of an analytical framework' (June 2008).

We considered proposals based on the above criteria. In situations where a case was not fully made, we challenged all or part of the expenditure. In the latter case, we reduced proposed expenditure by either 15% or 25% based on our view of the areas of weakness within the proposals. In total, we included £414 million in price limits for resilience schemes.

4.7 Renewable energy

A number of water and sewerage companies included proposals in their final business plans for renewable energy generation projects. These proposals are part of wider activities to reduce carbon emissions. Reducing carbon can also deliver long-term cost savings for consumers. We considered the following questions as we assessed companies' proposals.

- Do the proposals fit with an overall strategy?
- Have technology maturity and risks to delivery been considered?
- Has the company described the outputs for operational expenditure savings for consumers?
- Have Renewables Obligations Certificates (ROCs) been accounted for?
- Has the CBA case been justified on a "spend-to-save" basis?
- Is there any double counting between consumers' willingness to pay, the shadow price of carbon and income from ROCs?

We challenged proposals against these criteria. If a company did not make a compelling case, we challenged all or part of the expenditure. In the latter case, we applied a challenge to expenditure of either 15% or 25% based on our view of the areas of weakness within the proposals. We included £57 million in price limits for renewable energy proposals, which will deliver more than £20 million in operational costs savings over 2010-15, with continuing benefits in subsequent years.

4.8 Enhanced service levels

4.8.1 Sewer flooding

Price limits will enable sewerage service providers to continue to make progress to reduce the risk and incidence of sewer flooding. Within the CIS baseline we have assumed investment of £1,157 million (see table 36) of expenditure compared with company proposals of £1,579 million.

Table 36 Sewer flooding expenditure

Company	Company proposal			Final determinations		
	Expenditure to reduce the risk of flooding internally at least once in 10 years £m	Expenditure on other sewer flooding outputs £m	Total £m	Expenditure to reduce the risk of flooding internally at least once in 10 years £m	Expenditure on other sewer flooding outputs £m	Total £m
Anglian	66.7	11.4	78.0	45.3	10.1	55.5
Dŵr Cymru	29.1	46.3	75.4	29.0	46.3	75.3
Northumbrian	124.0	2.0	126.0	119.3	0.9	120.1
Severn Trent	124.1	79.0	203.1	113.0	44.5	157.5
South West	17.8	6.1	24.0	19.4	6.5	25.9
Southern	44.5	140.0	184.4	21.0	58.1	79.1
Thames	367.8	87.4	455.2	257.5	67.8	325.4
United Utilities	98.2	57.2	155.4	93.2	33.7	126.9
Wessex	16.4	32.3	48.7	17.4	33.1	50.5
Yorkshire	78.3	84.4	162.7	73.6	67.1	140.7
Industry total	**966.9**	**546.0**	**1,512.9**	**788.6**	**368.2**	**1,156.8**

In assessing the companies' final business plans, we have made four broad challenges to their proposals.

- **Cost-benefit analysis** – we have not applied a rigid cost-benefit test at scheme level, but we have taken account of wider evidence on customer priorities and willingness to pay alongside CBA evidence. We have excluded programmes aimed at 1-in-20 year, or external flooding risks, if they have poor CBA or willingness to pay evidence.

- **Forecast new sewer flooding problems –** we have challenged companies' forecasts of newly emerging sewer flooding if they were not well justified, especially if higher than the five-year average for net additions.

- **Major scheme challenges –** we have removed or reduced the scope of schemes where there was no or limited information about costs, benefits or where we felt the level of risk reduction proposed did not appropriately balance the risk between company and customer.

- **Reduction in high risk of flooding –** we asked two companies to develop their proposals so that there was a larger reduction in the numbers of properties on the high-risk registers.

Price assumptions include capital expenditure of £789 million to reduce the number of properties at high risk of sewer flooding and respond to newly emerging problems.

4.8.2 Other service enhancements

Before concluding that customers should pay for the projects proposed, we checked that the companies had demonstrated:

- the need for improvement;
- consumer support for the improvement (through willingness to pay);
- an indication of the priority consumers attach to it;
- evidence that the proposed solution is cost beneficial; and
- clear and measurable outputs.

Price limits include an assumption of £11.8 million to address localised problems with the taste and odour or pressure of drinking water.

4.8.3 Odour from sewage

Water and sewerage companies proposed just over £120 million of expenditure to tackle issues of odour at sewage treatment works and pumping stations. Price limits include approximately 90% of this expenditure following challenges on scope, cost benefit and scheme costs.

4.8.4 Pollution incidents

In addition to the cost allowed within price limits under the quality programme, water and sewerage companies proposed just over £80 million of expenditure to tackle issues of pollution from the sewerage system to watercourses and rivers as enhanced service improvements. Price limits have allowed approximately 90% of this expenditure following challenges on scope, cost benefit and scheme costs.

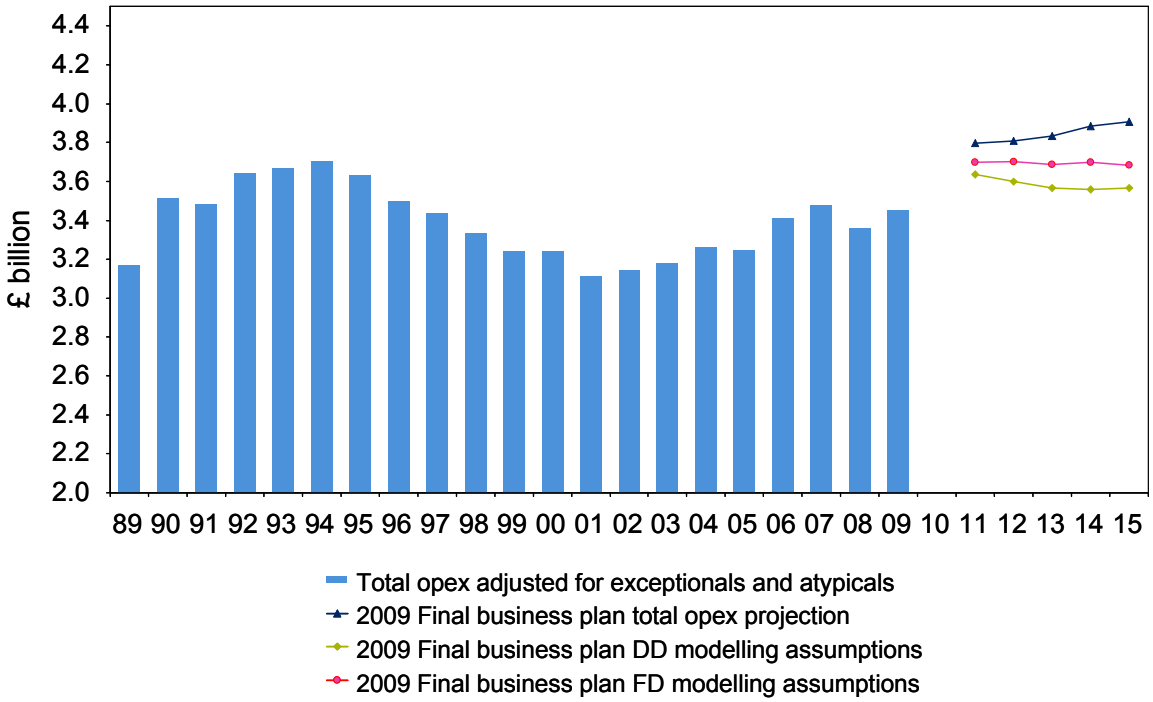
4.8.5 Revised Bathing Water Directive and bathing water improvements

One company proposed additional expenditure for the revised bathing water programme to achieve the 'Excellent' standard at a number of beaches. We included expenditure where proposals are cost beneficial.

4.9 Operating expenditure

Figure 11 shows the trends in operating expenditure since 1989. It also shows the projections we have assumed in price limits and the assumptions that the companies made in their final business plans. Each company will incur this expenditure in the day-to-day running of its business – including wages, chemical costs, energy costs, business rates, and licence fees.

Figure 11 Industry operating expenditure since 1989



Price limits assume that in 2015 the base operating expenditure needed to deliver services to customers will be 1.2% higher than current levels (2008-09). Our final determination assumptions for operating expenditure start with each company's operating expenditure in 2008-09 as reported in their June returns. We applied company-specific efficiency challenges based on our analysis of companies' relative efficiency in 2008-09.In addition we need to allow for the operating expenditure needed to deliver improved quality standards, to meet increased demand for water, and to improve customer service standards are included. This means that the total operating

expenditure for 2015 increases by about 7% compared with the current level. Companies had asked for an increase of 13%.

Figures 12 and 13 show the main components of the change in operating expenditure between 2008-09 and 2014-15. The figures show that the increase in operating expenditure is partially offset by our efficiency assumptions. Figure 13 provides a breakdown of the increases in operating expenditure by type.

Figure 12 Key drivers of operating expenditure by 2014-15

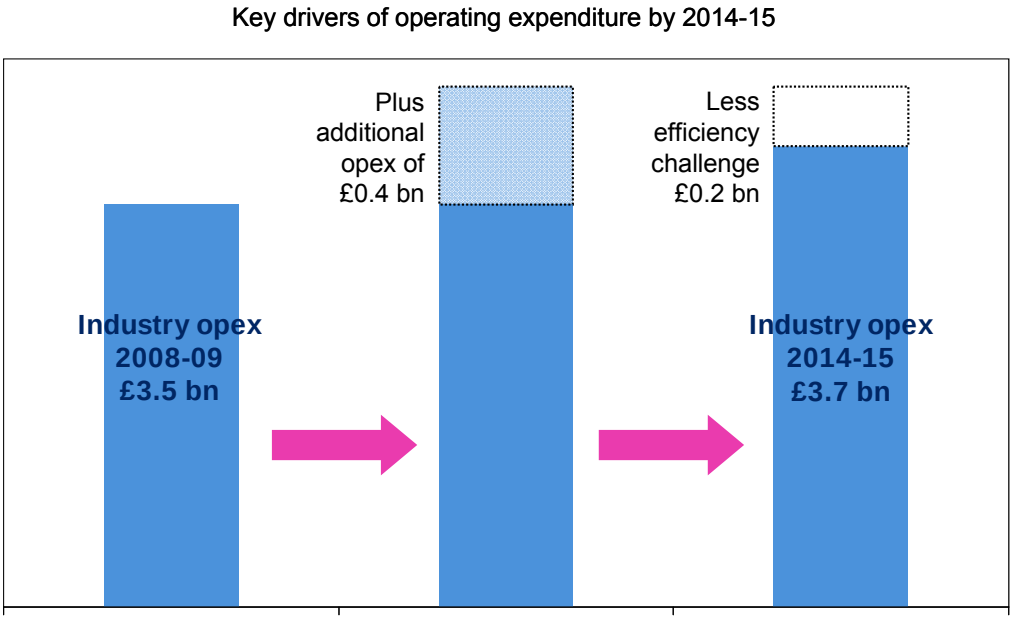
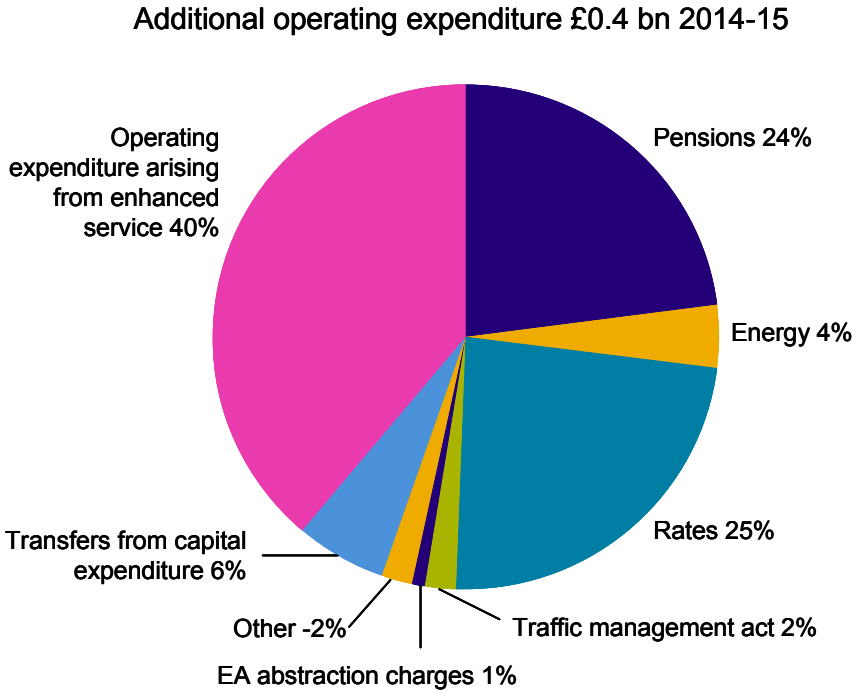


Figure 13 Additional operating expenditure 2014-15



The 'other' category is negative because it includes spend to save outputs

Table 37 sets out our assumptions for each company for operating expenditure. It shows operating expenditure for the water and sewerage services separately and on a £/property basis.

Table 37 Operating expenditure by company (annual average post-efficiency)

	Operating expenditure (annual average) 2010-15					
	Water	Sewerage	Total	Water	Sewerage	Total
	£m	£m	£m	£/property	£/property	£/property
Water and sewerage companies						
Anglian	172	221	394	86	86	172
Dŵr Cymru	129	115	244	97	85	181
Northumbrian	164	85	248	85	71	157
Severn Trent	251	246	497	75	64	139
South West	73	71	144	94	101	196
Southern	75	143	218	72	77	149
Thames	327	301	627	91	54	146
United Utilities	253	240	493	83	79	162
Wessex	58	88	145	100	76	176
Yorkshire	163	150	313	77	71	149
WaSC total	**1,665**	**1,658**	**3,323**	**84**	**71**	**156**
Water only companies						
Bournemouth & W Hampshire	17		17	88		88
Bristol	45		45	90		90
Cambridge	11		11	86		86
Dee Valley	11		11	88		88
Portsmouth	19		19	61		61
South East	79		79	90		90
South Staffs	42		42	78		78
Sutton & East Surrey	26		26	95		95
Veolia Central	104		104	83		83
Veolia East	7		7	90		90
Veolia Southeast	8		8	114		114
WoC total	**370**		**370**	**85**		**85**
Industry total	**2,036**	**1,658**	**3,694**	**84**	**71**	**156**

Most of the increases in expenditure that the companies asked us to consider were in certain areas such as:

- pensions;
- energy costs;
- business rates; and
- bad debts.

We discuss these and other areas further below.

4.9.1 Energy costs

Changes in energy prices are just one of the many business risks that companies face. We have considered our approach to energy alongside the other risks, the mechanisms we use for handling uncertainties and, more broadly, the cost of capital we set. Eleven companies included increases in energy costs in their final business plans, with individual company increases (compared with 2008-09) ranging between 1% and 16% of operating expenditure by 2014-15 and a total increase of £20 million by 2014-15.

While some companies asked us to put a notified item or a cost pass through mechanism in place to guard against future increases in energy costs, we continue to believe that this is not necessary for two key reasons.

- Changes in energy prices are a risk that RPI indexation partly mitigates.
- The base operating expenditure figure we take forward from 2008-09 into price limits already includes energy costs at a level we think is appropriate for many companies.

However, we have looked again at the base year energy costs both in light of company representations on our draft determinations and future energy prices. If companies have procured effectively and their base year (2008-09) energy costs are very low, then we have included a specific increase to their costs. We did this at the draft determination but we have increased the unit rate for energy from our draft determination assumptions. This means that 11 companies (three water and sewerage companies and eight water only companies) now receive an higher energy cost assumption compared with four companies at draft determinations.

We continue to believe that the companies themselves can manage any remaining risks related to energy costs through effective usage and price management, including hedging. The approach that a number of companies have taken, both in the current price review period and in their business plan strategies for managing energy price volatility, supports this view.

We have also changed our approach from draft determinations to the treatment of energy costs in our assessments of relative efficiency. We did not adjust our assessments of relative efficiency for this uplift in energy costs in the final price limits. We believe that this maintains incentives for companies to continue to procure effectively as they will see the benefit in their operating cost relative efficiency assessment.

4.9.2 Pensions

Companies' pension arrangements are a matter for their managers, but in setting price limits, we need to enable efficiently managed companies to finance their functions. This includes the cost of providing pensions as part of their remuneration arrangements. Most companies provide 'final salary' pension schemes (known as 'defined benefit schemes')

for their current employees, although almost all have decided not to offer them to new employees.

Meeting the liabilities to past employees and the expectations of current employees is a significant cost for the companies. When we set price limits in 2004, we made an assumption for increased costs to address pension scheme deficits if the companies had soundly-based proposals. Despite this, recent financial events, increasing longevity and changes in accounting rules means the cost of defined benefit schemes are rising significantly.

Because of changes in the way companies account for their pension costs, it is more appropriate to consider the cash contributions they have made in the period 2005-10 and the projected cash contributions for 2010-15. The companies charged £89 million of pensions costs in their regulatory accounts for 2008-09. This is significantly less than the total cash contributions of £200 million made in that year. Although the accounting charge is broadly similar to the ongoing service contributions, the companies are also making deficit recovery payments of about £92 million. Therefore, we asked companies to use the cash contributions agreed with pension scheme trustees as the starting point for their pension projections for 2010 onwards.

In our draft determinations, we allowed in full the projected ongoing service contributions based on the most recent actuarial valuations for each scheme. In addition, we included half of the deficit from the most recent scheme valuation assuming recovery of the deficit over a ten-year period.

All companies have now asked us to consider higher operating expenditure assumptions for pension costs. Companies' business plans included a total of £263 million a year of pension contributions for 2010-15, (compared with £89 million in 2008-09 as noted above). This has increased to £305 million following updated information in companies' representations.

In their business plans, companies argued that they need increases to meet future funding requirements (based on the recent financial performance of the pension funds and assumptions about the longevity of pension scheme members). Some companies also asked us to reflect an additional amount, over and above the deficit recovery payments agreed with trustees, to take account of the most recent changes in the market values of scheme assets.

Other companies took the view that customers should not fund in full the recent fall in equity values (which has a significant impact on the scheme funding and deficit position) at this price review. Two companies concluded in their business plans that, consistent with the approach we took in 2004, customers should fund only 50% of any deficit recovery payments. One further company has accepted this as part of its representations to us on our draft determinations.

About two-thirds of companies raised the treatment of pension deficits in their representations on our draft determinations. In particular, companies asked us to reflect more recent market movements, which have increased deficits since the last agreed valuations. They also raised the need to finance 100% of deficit contributions (rather than the 50% we assumed in our draft price limits).

In general, companies have projected that funding deficits will be recovered over periods ranging from 7 to 20 years. A number of companies have chosen a ten-year period. They believe this is consistent with the period that the Pensions Regulator has set as one of its trigger points for a review of a scheme's recovery plan. Others have signalled in their representations that 15 years may be more appropriate.

We have included £211 million a year of pension contributions by 2014-15 in our final determination compared with £184 million in our draft determinations. We have allowed in full the projected ongoing service contributions based on the most recent actuarial valuations for each scheme.

We would normally base our analysis of pension costs on the most recent triennial valuation since this would provide the most robust evidence on pension deficits. However, the recent volatile market conditions mean that such valuations could quickly become out of date. Consequently, in looking at deficit recovery payments, if companies have raised the issue of later valuations in their representations, we have taken into account updated actuarial information.

In our final determinations, for schemes that have a date for a full actuarial valuation:

- after March 2008, we have based our projections on that valuation. We have allowed half of the deficit recovery (assuming recovery of the deficit over a minimum of ten years); and
- of March 2008 or earlier, we have taken into account updated actuarial information and reflected the more recent deficit positions. We have included half of the deficit recovery (assuming recovery of the deficit over a minimum of 15 years).

We have used a 15-year period for these later deficit positions because they arguably reflect the worst of the market decline and therefore capture deficits at their highest point. In addition, they are based on funding or actuarial updates that reflect only the market movement. They do not consider the full range of actuarial assumptions or reflect a position that has been agreed with trustees. Three companies have used a 15-year period in the updated pension costs they have set out in their representations.

We have continued to allow half of the deficit recovery similar to the approach we took in 2004. We consider, for the five-year period 2010-15, that this reflects an appropriate balance between the amount which customers should fund now and that which may be funded through other mechanisms (including the scope for market recovery). We

consider that our approach provides strong incentives for companies to continue to manage their pension costs effectively. Two companies accepted this approach in their final business plans. In addition, some other companies have acknowledged shareholders' role in financing pension deficits in their representations.

We recognise that funding pension deficits is a long-term issue. We will therefore review and invite comment on the treatment of these costs (including proposals such as the addition of deficits to the RCV) after the price review. This will inform our approach for future price limits.

4.9.3 Customer debt

In their final business plans, companies proposed a range of approaches to bad debt costs, their main concern being the impact of the current economic climate. Most proposed continuing a notified item. A number also sought to include increased costs typically in line with their proposed bill increases.

We said in our methodology paper that we did not see any compelling reason to continue the current notified item on the costs arising from bad debts beyond 2010. Companies now have more experience and we can expect them to forecast and manage their bad debt position more effectively. We maintained this position for our draft determinations, but said that we would take a final view on the need for a notified item for bad debt in our final determinations.

The long-term trend in companies' debt charges as a percentage of turnover and the debt related costs per customer has been relatively stable since 2003-04. We think that it is important to retain strong incentives on the companies to improve their collection of the revenue that is due to them. Many companies report that they are becoming more effective at collecting current bills but have difficulties with longer-term debtors. More companies are adopting good practice and innovative approaches to debt, for example using more targeted debt recovery techniques made possible through effective customer segmentation, or introducing social tariffs where they prove to be self-funding.

Price limits roll forward the costs incurred by companies during 2008-09 (excluding exceptional items) and will therefore reflect both the level of bills in 2008-09 and the difficult economic conditions at that time.

We believe that providing for the continuation of 2008-09 costs, together with continued improvement in revenue collection would, under normal economic circumstances, mean that companies are able to manage bad debt as a normal business risk. The Walker review has supported recommendations that we and the companies put forward for changes to legislation, which if implemented would make it easier for companies to collect revenue. By not increasing bills for many companies, our price limits will avoid adding to debt levels in the way companies forecast.

The main continuing risk relates to the duration of the current economic climate and its impact on customers' payment of their bills after April 2010. We have considered a range of recent evidence, including independent forecasts of economic measures and the extent of increases in unemployment. We do not consider it appropriate to assume in price limits that debt related costs will increase. However, we accept that, in the current economic climate, a notified item for bad debt will ensure that our price limits reflect a fair balance of risk between companies and their customers. The notified item will relate to increases in household debt costs resulting from worsening economic circumstances in the company's operating area. We expect companies to continue to manage commercial debt as a normal business risk.

A company wishing to make use of the notified item will need to demonstrate that it proactively applies a best practice approach within a coherent strategy to maximise cost-effective revenue collection. When considering any applications for interim determinations, we will carry out a holistic review of areas such as:

- tariffs;
- billing;
- revenue recognition;
- bad debt provisioning;
- collection policies and practices; and
- links to base year efficiency assessments.

4.9.4 Business rates revaluation

The Valuation Office Agency (VOA) carries out a revaluation of all non-household rateable values in England and Wales every five years. The next revaluation is due to come into effect on 1 April 2010 and all non-household properties will have their rateable value assessed by reference to levels of rental value as at 1 April 2008.

The VOA assesses water and sewerage service rateable values using different methods. This means that the impact of the rating revaluation on future business rates costs will be different for each service. We did not assume any increase in sewerage rates at draft determinations. Since then, the VOA has published updated rateable values for both the water and sewerage services and an updated view of the English and Welsh poundages. We recognise that there will be a material change in sewerage rateable values, and we have therefore taken account of this in our final determinations.

Our work with the VOA shows that most companies will face higher costs for rates. For the final determinations, we have assumed that the costs of rates for the water service will increase in aggregate by about £78 million by 2014-15, and for the sewerage service we have assumed an increase of about £28 million by 2014-15.

4.9.5 Costs relating to the introduction of competition

We have made no assumption about costs relating to introducing competition. We consider that a company with flexible accounting systems and processes should be able to accommodate changes relating to the introduction of competition, such as work on accounting separation. Any additional cost, in general, should not be material. However, we recognise that new legislation may lead to competition related costs that may affect companies. This may qualify as a relevant change of circumstance and if material may trigger an interim determination (see section 5.3.1).

4.9.6 Adoption of private sewers

We have not included in price limits any expenditure relating to the transfer of private sewers and lateral drains that Ministers have signalled will take place from 2011. As requested, companies excluded such costs from their final business plans pending further clarification on the timescale and scope of the transfer. This should become clearer during the drafting of the regulations giving effect to the transfer. As stated in chapter 5, companies will be able to seek recognition of significant financial costs arising from the transfer using the interim determination mechanism.

4.9.7 Traffic Management Act

The Traffic Management Act 2004 has allowed highways authorities to implement permit schemes for works and other activities in the street since April 2008. At present, there remains considerable uncertainty over the take-up of permit schemes. This makes it difficult for companies to assess the future impact of these schemes on their costs. As a result, we have not increased the operating expenditure allowed in price limits for these costs, except where permit schemes are awaiting approval and there is a high degree of certainty that companies will incur additional costs. However, we have included a notified item as part of our final determinations to cover the costs of permits. This will allow companies to recover the costs as part of an interim determination (see section 5.3.1).

4.9.8 Increases in abstraction charges

Abstraction charges levied by the Environment Agency could increase at a faster rate than inflation to finance the costs of revoking or modifying abstraction licences where there is a demonstrable adverse impact on the environment.

In their final business plans and representations on our draft determinations, companies asked us to take account of the Environment Agency's future indicative increases in abstraction charges. The uncertainty about future increases has meant that we have been unable to include allowances in the environmental improvement unit charge component of abstraction charges (the part of the abstraction charge levied to fund the Environment Agency's compensation scheme). However, we have included a notified item as part of our final determinations to cover any changes in the environmental

improvement unit charge component of abstraction charges other than the change arising from RPI.

4.10 Future efficiency

When we set price limits, we include incentives for companies to improve their efficiency over time. Our overall efficiency assumptions have two components.

- **A catch-up improvement factor that challenges a company to make progress towards the top performing companies.** For operating expenditure, this is explicit; for capital expenditure, our approach builds the comparative efficiency challenge into the CIS ratio, which is structured around a central estimate of efficiency based on a middle ranking company.

- **A continuing improvement factor linked to the improvement that we could expect from the leading or frontier companies.** This applies to both operating and capital expenditure.

In reaching our views on the scope for future efficiency, we have considered how costs and productivity will change in the next price review period. We have taken advice from consultants with expertise in this field, which we published in PR09/28, 'Scope for efficiency studies' (February 2009). We have also considered:

- each company's views in its business plans on the scope for future efficiency;
- the significant future capital programme included in price limits; and
- the additional operating costs we have included in price limits.

In their representations, companies argued that our view on continuing efficiency was not supported by the advice on the scope for efficiency carried out for us and the separate study undertaken for Water UK. We disagree. We considered these studies alongside other evidence and they informed our overall view. We also looked again at the studies, which we discuss below.

Since publishing PR09/28, we have looked again at our conclusions in light of current economic circumstances. We did this for draft determinations and again for final determinations, taking account of latest economic data. We considered trends in both future productivity and input prices, and how these would impact on the scope for future efficiency.

We looked particularly closely at trends in labour costs as these form significant but different proportions of the industry's input costs for both operating and capital expenditure. We have taken a different view of the scope for continuing efficiency for operating and capital expenditure, which in part reflects the different mix of input costs and different views on future productivity for each type of expenditure.

We have included in price limits challenging assumptions of future efficiency savings over and above those achieved in the economy as a whole. We have concluded that there is still scope for the best performing companies to make further real efficiency improvements. For operating expenditure, we have taken into account the scale of the future capital programme and the opportunities this presents for delivering operating expenditure efficiencies. Our analysis of each company's relative efficiency highlights two things.

- There is still considerable variation in performance.
- The leading companies have continued to improve their performance.

4.10.1 Continuing operating expenditure efficiency

We have assumed a continuing efficiency improvement factor of 0.25% a year for both water and sewerage base operating expenditure. We have revisited this assumption since draft determinations, but our view remains unchanged.

For enhancement operating expenditure, we have included factors one and a half times that for base expenditure. This reflects both the historical trend of substantial outperformance of our assumptions in this area and the greater scope for efficiency when operating new and enhanced assets.

4.10.2 Relative operating expenditure efficiency

The efficiency catch-up factor for base operating expenditure assumes that a company will close 60% of the assessed efficiency gap to the frontier performance by 2014-15, with equal improvement steps in each year. For enhancement operating expenditure, we have assumed one and a half times the base catch-up factors.

For our final determinations, we have used our 2008-09 assessments of relative operating expenditure efficiency. Table 33 sets out the assessments of relative operating expenditure efficiency. We have also adjusted the modelled operating expenditure to:

- reallocate leakage costs from infrastructure renewals expenditure to operating expenditure for five companies (see section 4.3.5), and from other capital expenditure to operating expenditure for one company; and
- change the basis of the pensions adjustment from a charge to a cash basis (see section 4.9.2).

We have made these changes to ensure consistent treatment of costs between companies. In a change from our draft determinations, we have not adjusted our efficiency assessments for energy costs. We discuss this further in section 4.9.1. We have also revised our adjustments for special factors for some companies to take account of their updated 2008-09 costs where material together with information in companies' representations. We have also chosen the benchmark company for each

service carefully to ensure that the cost structure of the benchmark company is representative of the industry.

The catch-up factors range between 0% and 2.9% a year for water and 0% and 2.2% a year for sewerage. Table 38 shows the efficiency bands used for our final determinations. At the 2004 price review, we saw a clustering towards best performance and a major improvement in relative efficiency since the previous price review in 1999. We introduced enhanced incentives at the 2004 price review to stimulate the leading companies to improve their efficiency. Our relative efficiency analysis suggest that the leading companies have continued to improve their efficiency, and that the gap between the most and the least efficient companies remain similar to that at the last price review.

Table 38 Relative operating efficiency bands for final price limits

	Water Band (range A to E)	Sewerage Band (range A to E)
Water and sewerage companies		
Anglian	A lower	B upper
Dŵr Cymru	C lower	C upper
Northumbrian	B upper	C upper
Severn Trent	B upper	A lower
South West	B lower	B lower
Southern	A upper	B upper
Thames	B upper	A upper
United Utilities	B upper	C upper
Wessex	B upper	A upper
Yorkshire	A upper	A lower
Water only companies		
Bournemouth & W Hampshire	B upper	
Bristol	B upper	
Cambridge	C upper	
Dee Valley	B upper	
Portsmouth	A upper	
South East	A lower	
South Staffs	A upper	
Sutton & East Surrey	A lower	
Veolia Central	C lower	
Veolia East	B upper	
Veolia Southeast	C upper	

4.10.3 Incentive allowance for operating expenditure

We introduced the operating expenditure incentive allowance in 1999 as a formal incentive mechanism to allow companies to retain, for a minimum of five years, the benefit of incremental outperformance of our expectations of operating costs. At the last price review, we introduced an outperformance multiplier. This improved the outperformance rewards, for both operating and capital expenditure for those companies

that we assessed as leading. We set out how this would operate in PR09/04, 'The opex incentive allowance and the outperformance multiplier for 2005-10' (October 2009).

For the water service, seven companies receive an incentive allowance, including five companies that also receive enhanced outperformance rewards. For the sewerage service, three companies receive an incentive allowance with two of these also receiving enhanced outperformance rewards.

4.10.4 Capital efficiency

For our final determinations, we have used the cost base as our primary determinant of capital maintenance and capital enhancement efficiency.

Our assumptions on future capital efficiency are in two parts.

- A single continuing efficiency assumption that is the same for every company.
- A company-specific relative efficiency assumption compared to that of a middle ranking company.

Our approach for relative capital efficiency needs to be viewed in the overall context of the CIS incentive mechanism, which challenges and incentivises companies in a new way (see section 4.2). Efficiency challenges are with respect to a median point in the distribution, rather than a 'frontier' benchmark approach, as we have used in previous price reviews.

If we ignore other elements of the CIS (such as the additional income adjustments) and focus simply on the efficiency challenge built into our assumptions, the total assumption for efficiency gains in the CIS baseline is significantly lower than under a frontier approach. This gives greater scope for companies to outperform the CIS baseline assumptions. We estimate that a frontier approach would have resulted in an efficiency challenge of up to £1.5 billion more across the industry in 2010-15.

4.10.5 Continuing capital efficiency assumptions

We have assumed continuing efficiency improvements for all companies of 0.4% a year for all capital expenditure incurred during 2010-15; for the 2015-25 period, we have assumed 0.25% a year; beyond 2020 we have assumed no continuing efficiency. We have taken a more conservative view of the scope for continuing efficiency after 2015 to reflect the greater uncertainty in predicting costs and productivity further into the future. We discuss our approach to continuing efficiency in section 4.10.

4.10.6 Relative capital efficiency assumptions

During price reviews, we use the cost base comparative tool to assess relative efficiency in procuring and delivering capital projects. We do this by comparing company estimates

of capital works unit costs for a representative range of standardised capital projects (standard costs).

Each company provided us with draft and final audited estimates for the standard costs based on, as far as possible, its own current and previous capital works programmes. These estimates were subjected to focused independent audit and review by the reporters.

With assistance from our cost base consultants, Jacobs Engineering, we have carried out a detailed assessment and review of the companies' and reporters' reports for each submission. We have issued queries where we have questions about the compliance with our reporting requirements and the comparability between companies. We published a feedback report on companies' draft cost base standard costs in PR09/16, 'Cost base feedback report' (August 2008).

Our concerns at draft business plan stage related to compliance and consistency. This prompted us to strengthen our approach to reviewing the standard costs in the final business plan. Accordingly, our consultants visited each company with the objective of ensuring that the most material differences between companies were explored and any inconsistencies in the composition of standard costs were identified. We published an executive summary of the key findings and conclusions from this review in PR09/34, 'Executive summary: findings from the cost base audits (March–May 2009)' (August 2009).

Our overall approach for final determinations remains unchanged from that set out in PR09/16. For each standard cost, we have:

- looked at the data distribution;
- identified a fixed cost for comparison; and
- measured how far proportionally above or below this, each company's standard cost is.

We have selected the median value as representing this fixed cost.

For infrastructure, we weight each of these proportional distances from the median values by the forecast proportions of capital investment planned for the 2010-15 period. For mains and sewers, we are able to reflect the composition of each company's asset stock in this weighting. For non-infrastructure, the link between existing assets and future work is less clear, so for each asset group (such as water treatment works) we take a simple average of the proportional distances above or below the median values in this area and weight this by the associated forecast proportion of capital investment.

For mains, communication pipes and sewers we use 100% of the difference to the median value to contribute to overall efficiency. This reflects the confidence we have in the consistency and comparability of these standard costs due to the regular activity

undertaken on these assets. For all other assets, we use only 50% of the difference because we have less confidence in the comparability of these standard costs. Activity on these tends to be less frequent and companies often provide estimates based on quotations and/or costs associated with a relatively small number of schemes.

Changes in the cost base since draft determinations

We reviewed the comments made in Jacobs' executive summary in PR09/34 and on their advice, changed our approach to household meters.

For household meters, the horizontal audit highlighted differing approaches to deriving these standard costs. The discussions with companies revealed that while some carry out large-scale programmes of meter installation others do this work as reactive one-off installations. Jacobs considered that a sizeable element of the variance in standard costs was not related to efficiency in delivery of similar work. For our final determinations, we have therefore used only 50% of the difference to the median value for these assets as opposed to the 100% that we used at the draft stage.

We also excluded the standard costs for 'Replacement UV disinfection' because Jacobs considered this particular item was not helping to inform the cost base process as a result of being predominantly based on quotations that were not well aligned to outturn costs.

We also removed the standard costs for 'installation of denitrification'. The low number of costs submitted suggests that this process was not sufficiently widespread to provide a useful standard cost in the analysis.

We carried out a detailed review of the issues and comments that companies and reporters made on cost base and capital efficiency in their representations.

The two main issues identified in the representations were the:

- justification for our continuing efficiency assumptions explained in section 4.10; and
- use and application of the BCIS index which we discuss below.

Many issues were company specific in nature affecting individual standard costs, but four companies (Portsmouth, Southern, Veolia East and Veolia Central) proposed revisions to their standard costs set out in their final business plan submissions.

To be fair to all companies and to maintain the integrity of the whole process, in determining whether to make any changes to cost base submissions for our final determinations, we considered the merit of any argument. We then considered whether there was supporting evidence for any changes.

We accepted a limited number of revisions from one company on the basis that it presented persuasive arguments supported by strong evidence. We considered it proportionate to do this. We did not progress other requests for changes, as they did not meet the criteria set out above.

We will publish a report on the companies' final cost base standard costs in December 2009.

Regional price adjustment

We reviewed the concerns raised by some companies in their business plans about the appropriateness of the Building Cost Information Service (BCIS) index. While we note that the basket of construction projects used to generate the index was developed primarily for the building industry, we maintain that it is still appropriate for use in the cost base, since we are using it to reflect regional differences in labour and material costs.

We have reviewed whether regional differences in labour and material costs are comparable across different construction industries and conclude that while the actual costs may vary, the regional differences are comparable. We have therefore continued to use the BCIS index to assess the regional variation in construction prices from the England and Wales average. We weight local indices by population to obtain average figures for each company's area and the whole of England and Wales. We then compare each company's index figure to the England and Wales average.

For our final determinations, we have made two significant refinements to our approach based on the representations of some companies.

- The first refinement involves using a five-year average index from 2004-05 to 2008-09 instead of the index for 2007-08 only. This takes account of the movements in the BCIS index over time and reflects the variations in construction prices over the same AMP4 period from which companies have compiled the unit costs used to derive their standard costs.

- The second refinement concerns the proportions of each standard cost that we consider are affected by regional prices. We acknowledge that regional prices affect companies' costs and expenditure, and are to some extent outside management control. But some items, such as mechanical and electrical equipment and design services, are procured in a national market. Therefore, regional prices affect only part of capital costs. For our final determinations, we have carefully considered some companies' arguments that our proportions were not fully applicable to the activities of the water industry. We have reviewed our approach in detail, using a greater granularity of cost breakdown information specific to water industry costs. We have also considered the size and location of the company in our assessment through a series of tests and hypotheses for each cost element.

Table 39 summarises our view on the proportions of standard costs affected by regional prices in our final determination cost base analysis. For comparison, we also show our assumptions for draft determinations.

Table 39 Proportions of standard costs affected by regional prices

	Draft determination	Final determination			
	All companies	Large company		Small company	
		Low cost region	High cost region	Low cost region	High cost region
Water service					
Mains	70%	43.1%	66.2%	36.2%	65.3%
Communication pipes	74%				
Household meters	58%				
Water treatment works – surface	54%	33.5%	54.2%	27.4%	69.4%
Water treatment works – ground	74%				
Service reservoirs	82%				
Water pumping stations	38%				
Sewerage service					
Sewers	70%	43.1%	66.2%		
Sewer structures	82%				
Sewage pumping stations	38%	33.5%	54.2%		
Sewage treatment works	50%				
Sludge	74%				

All companies have benefited from this revised element of our approach. We believe our application of the BCIS regional price indices better reflects the characteristics of the water industry and the individual circumstances of each company. We will publish further details on our assessment in our cost base feedback report in December 2009.

Table 40 provides an overview of the combined cost base and continuing efficiencies applied and the impact of these on industry capital expenditure.

Table 40 Overall capital expenditure efficiency challenge

	Efficiency challenge (£m)	% of capital expenditure
Water	+4	0.0%
Sewerage	-367	-2.8%
Total	-363	-1.6%

As set out in section 4.10, the aggregate capital efficiency assumed at this review of £363 million is considerably less than the £1.7 billion accruing from the approach used at the last price review. Tables 41 and 42 provide a summary of the cost base relative efficiencies applied for each company for each sub-service.

Table 41 Capital expenditure efficiency adjustments

	Water		Sewerage	
	Infrastructure	Non-infrastructure	Infrastructure	Non-infrastructure
Simple mean	+0.4%	-2.8%	+0.6%	-0.5%
Most efficient	+17.6%	+8.6%	+15.8%	+13.2%
Least efficient	-17.4%	-15.4%	-10.2%	-11.1%
Standard deviation	+10.5%	+6.2%	+8.6%	+8.5%

Note:
A positive number means a company is relatively efficient, so we have made a positive adjustment in setting the baseline and vice versa.

Table 42 Catch-up efficiency factors arising from the cost base

	Water		Sewerage	
	Infrastructure	Non-infrastructure	Infrastructure	Non-infrastructure
Water and sewerage companies				
Anglian	+17.6%	-3.9%	+15.8%	+9.5%
Dŵr Cymru	-2.9%	-0.7%	0.0%	-5.6%
Northumbrian	+10.3%	+8.6%	-3.5%	+4.3%
Severn Trent	+12.6%	-15.4%	+1.1%	-6.2%
South West	-9.2%	+0.5%	-3.3%	-6.6%
Southern	+8.6%	-6.2%	-10.2%	-11.1%
Thames	-6.1%	-3.7%	-5.0%	-2.5%
United Utilities	+13.1%	+4.4%	-8.0%	-7.9%
Wessex	+12.1%	+5.4%	+7.3%	+8.4%
Yorkshire	+8.2%	+7.4%	+12.2%	+13.2%
Water only companies				
Bournemouth & W Hampshire	-12.6%	-6.8%		
Bristol	+0.1%	+0.1%		
Cambridge	-5.7%	-4.0%		
Dee Valley	+2.1%	-2.0%		
Portsmouth	-6.5%	-10.3%		
South East	-13.2%	+1.7%		
South Staffordshire	+0.1%	-1.7%		
Sutton & East Surrey	-0.9%	-5.3%		
Veolia East	-17.4%	-10.0%		
Veolia Central	-13.6%	-6.9%		
Veolia Southeast	+12.5%	-10.6%		

Note:
A positive number means a company is relatively efficient, so we have made a positive adjustment in setting the baseline and vice versa.

5. Financial assumptions for setting price limits

This chapter sets out our approach to the key financial decisions necessary to set price limits. We attach a table showing the aggregate five-year financial information for each company in appendix 3.

5.1 Capital charges

Customers pay for capital expenditure over the lifetime of the assets financed. Bills to customers include:

- a current cost depreciation charge for above-ground assets, such as treatment works; and
- an infrastructure renewals charge (IRC) for underground assets, such as pipes, which form part of either the water or sewerage networks.

Together, we refer to these as ‘capital charges’.

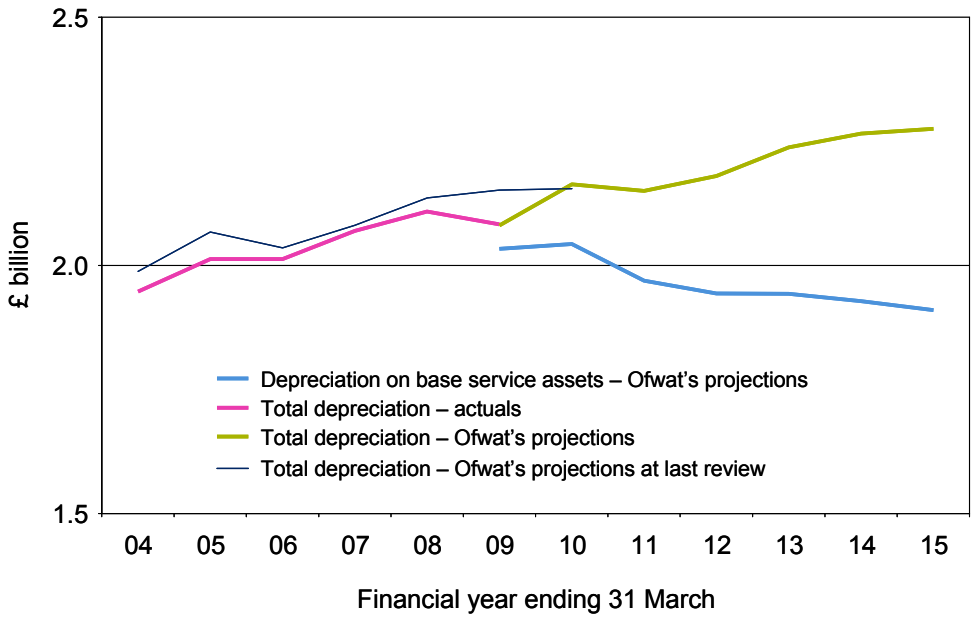
5.1.1 Current cost depreciation

Figure 14 shows the trend in depreciation charges from 2004 to 2015. For the period 2009-15, this shows depreciation on base services separately from total depreciation. It also compares the depreciation we assumed in price limits in 2004 with that charged in the companies’ accounts up to 2009. This shows that, in the period to 2008, companies’ depreciation charges were broadly similar to our assumptions. In 2009, the actual charges reported by the industry (in 2007-08 prices) are lower than that in the previous year.

Total depreciation continues to increase in 2010-15 because of the continued investment required for new enhancements, primarily the quality programme and expenditure to maintain the supply/demand balance, which increases the capital base. We discussed capital expenditure (from which we derive the depreciation charges) in chapter 4.

The small dip in depreciation in 2010-11 reflects the impact of the companies’ asset revaluation carried out at the price review and our adjustments to depreciation arising from our overall check against maintenance expenditure. We discuss these in more detail below.

Figure 14 Current cost depreciation charges 2004-15



Asset values

For this review, we required all companies to carry out a full revaluation of their assets (on a modern equivalent asset (MEA) basis). We expect such a valuation to result in a decrease in current cost depreciation. However, the revaluation has led to an increase in current cost depreciation charges for about half the companies above the levels they are currently reporting in their regulatory accounts.

A number of companies have been unable to explain fully in their business plans what is driving the increase and have attributed it to a more robust methodology adopted for this review. Companies have also attributed the increase to assets that were 'undervalued' at previous reviews or omitted entirely. Companies have not consistently carried out revaluations or made the linkage with the current cost depreciation. Issues included:

- whether companies have properly valued assets on an equivalent asset basis;
- the use of the construction price index to uplift costs within cost models; and
- the assessment of remaining asset lives.

In our draft determinations we allowed half of any increase in current cost depreciation arising from the MEA revaluations. However, we said that we would look more closely at this for our final determinations. Companies who had increases in current cost depreciation because of their asset revaluations provided more information to support and explain this. In our final determinations for seven companies, we have made specific adjustments to current cost depreciation. dependant upon the particular issues we have identified with each company. Other companies were not able to demonstrate that the increase in MEA value was justified. As a result, we have not included in price limits any increase in current cost depreciation arising from the revaluation.

Overall check on depreciation

We carried out our overall check on depreciation by comparing current cost depreciation with non-infrastructure capital maintenance expenditure over the period 1997-98 to 2024-25. This timescale is consistent with our long-term approach to capital maintenance planning. Given that companies have carried out full MEA revaluations, including reassessments of remaining asset lives, we expected them to be able to explain any differences between the current cost depreciation and expenditure. This has not been the case.

After taking into account valid explanations for differences between the two, we made downward adjustments to the current cost depreciation projections for eight companies. These adjustments totalled £265 million for 2010-15, about 2.4% of the total current cost depreciation charge. This is slightly less than the total adjustment we made in draft price limits. The decrease reflects additional information to explain the differences between depreciation and expenditure put forward by companies in their representations.

5.1.2 Infrastructure renewals charge

The amount of IRC charged in companies' regulatory accounts for 2005-09 was about 13% higher than we assumed when we set price limits in 2004. This reflects the significantly higher infrastructure expenditure incurred over that period than we assumed in our price limits.

The IRC that we have included in our final determinations is broadly in line with the amounts that companies have charged in the regulatory accounts since 2005. It is therefore higher than the amount we included at the 2004 price review.

For most companies, we have calculated the IRC using a 15-year average of infrastructure renewals expenditure (IRE) over the period 2005-20. We have accepted the cases that eight companies put forward to calculate the average based entirely on projected expenditure in the period 2010-25.

Five companies asked us to include an increase in IRC, over the ten-year period 2010-20, to recognise the IRE they have incurred since 2005 over and above the assumptions we made when we last set price limits. We have accepted the cases made by four of these five companies.

The IRC we have included in price limits (£4.1 billion) for 2010-15 is slightly lower than the total IRE (net of grants and contributions) we have assumed for that five-year period (£4.7 billion). This is because of differences in the profile of IRE over the 15-year period that we use to calculate the IRC. This may be because of a stepped increase in projected future expenditure levels from that incurred historically or because the expenditure levels in 2010-15 are not necessarily sustained into future periods. Any difference between the IRE and IRC that arises in the short term is financed through a return on the RCV.

5.2 Regulatory capital value (RCV)

At an industry level, the RCV continues to grow over 2010-15. This reflects the continued capital enhancement programme. By 2015, we expect the RCV for the industry to be £53 billion. The projected RCV increases by 11% over the period, slightly less than the 13% growth in the period 2005-10. This results from a change in the mix of capital expenditure for the next five-year period, which reflects more maintenance expenditure and less expenditure to grow or enhance the asset base.

At the level of individual companies, the picture is more varied. Over the period 2010-15, a number of companies continue to see sizeable RCV growth. For others, where the mix in capital investment has shifted to be mainly capital maintenance based, we expect little or no growth in the RCV. For example, the growth in the RCV for Thames from 2010-15 is 29%, reflecting the large enhancement capital programme. Over the same period, Portsmouth's RCV shows a decline of 12%.

Table 43 sets out the expected movement in the RCV for the industry. The position for individual companies is included at appendix 4.

Table 43 Industry regulatory capital value: movement between 2010-11 and 2014-15

£ billion (2007-08 financial year end prices)	2010-11	2011-12	2012-13	2013-14	2014-15
Closing regulatory capital value at 31 March 2010	48.02				
Opening adjustments	0.02				
Regulatory capital value at 1 April	48.04	49.03	50.76	52.22	53.19
New investment	4.20	4.99	4.77	4.32	3.59
Capital maintenance charges	-3.01	-3.05	-3.11	-3.14	-3.15
Adjustment for roll-out of past capital efficiency	-0.21	-0.21	-0.21	-0.21	-0.21
Regulatory capital value at 31 March	49.03	50.76	52.22	53.19	53.42

We have continued to use the same approach to and calculation of the RCV that we have used at previous price reviews.

We have adjusted the closing RCV at 31 March 2010 that we assumed at the 2004 price review (adjusted to take account of the interim determinations we carried out in 2005-10) to give an opening value at 1 April 2010 for this review. These opening adjustments are for:

- logging up, logging down and shortfalls (a net decrease of £556 million);
- the difference between the actual construction price inflation and our estimate from the 2004 review (an increase of £769 million); and
- land sales in the period 2005-10 (a decrease of £192 million).

Table 44 shows the analysis of logging up, logging down and shortfalls by service.

Table 44 Logging up, logging down and shortfalls

2004-05 to 2009-10 £m	Ofwat view of logging up, logging down and shortfalls for capital expenditure		
	Water	Sewerage	Total
Logging up	342.4	282.9	625.3
Logging down	-332.3	-537.2	-869.5
Shortfalls	-42.1	-269.3	-311.4
Net amount subtracted from/added to RCV	-32.0	-523.6	-555.6

Logging up or down of capital expenditure represents additional or reduced outputs that were not anticipated at the last price review, but were not part of an interim determination.

Where a company has not met a required output, we make a shortfall adjustment. We have made shortfall adjustments for nine companies. We adjust the RCV to remove capital expenditure assumed in 2005-10 associated with that output. We also recover the additional return that the company has earned on the capital expenditure in 2005-10. We do so through an adjustment to a company's revenue (rather than through the RCV). The total revenue adjustment for shortfalls for the industry for 2005-10 is £91 million.

The adjusted opening RCV is then rolled forwards taking account of:

- new investment;
- capital charges; and
- past capital efficiencies.

As at previous price reviews, we have smoothed the adjustment for the roll-out of past capital efficiencies over the five years on a net present value basis.

Where companies have financed additional investment out of capital efficiencies, we would not generally remove such investment from the RCV. Where expenditure is more than the assumed level on a service-specific basis, then a company needs to make a well-reasoned case why we should include the expenditure. Eleven companies have invested more than we projected at the last review, totalling £305 million and we have excluded this from the capital value.

5.3 Approach to risk and uncertainty

Providing water and sewerage services represents a low business risk compared with other industries. This is because of the :

- nature of the industry; and
- regulatory framework developed around it.

The price limits and the outputs are a package, which, by its nature, will include some outputs that turn out to be more costly and others that will be less so. For most outputs, we can make reasonably confident central estimates of costs and the other chapters set out how we have done this.

Inevitably, some uncertainty will remain. For example, during the price review period a company may face some changes to its required outputs and the costs it incurs compared to those assumed in the price limits. We have built flexibility into the regulatory framework in the form of a number of mechanisms that help to limit the risk and uncertainty companies face from such changes. In addition, the five-year price review ensures that companies do not carry the remaining risks for more than five years.

In light of our approach to cost estimation and the overall package of risk mitigations, section 5.4 sets out our views on the cost of capital appropriate to the industry. This seeks to remunerate investors for the risk they carry in the water and sewerage sectors relative to other investments. The mechanisms we use to mitigate risk are:

- five-yearly reviews;
- indexation (RPI and notified index);
- interim determinations (including notified items and relevant changes of circumstance)
- the ‘substantial effect clause’;
- logging up and logging down; and
- the ‘change protocol’.

For 2010-15, the symmetrical treatment of capital expenditure under the CIS and the revenue correction mechanism will give companies greater protection than they had in 2005-10.

Our change protocol for 2010-15 is included with our final determinations. It sets out a process for companies to follow should they wish to seek recognition in price limits for material changes to outputs defined too late for inclusion in our final determinations.

The key mechanisms which allow companies (or Ofwat) to adjust price limits between price reviews periods are the interim determination and the substantial effect clause. We discuss these further in the following sections.

5.3.1 Interim determinations

An interim determination allows price limits to be adjusted between periodic reviews. The formal mechanism is set out in each company’s licence. It can only be triggered by relevant items, the value of which, in aggregate, exceeds 10% of a company’s turnover. Relevant items are classified as either notified items or relevant changes of circumstance (RCCs).

At price reviews, we record notified items for specific items that we have not allowed for (either in full or not at all) in our final determinations. RCCs cover areas such as new or changed legal requirements and the company's failure to deliver an output included in price limits.

Our draft determinations concluded that notified items were required for:

- costs associated with the Traffic Management Act; and
- the impact of climate change on water resources.

In their representations, companies and other stakeholders put forward arguments for additional items the associated costs for which they believed should qualify for inclusion in an interim determination, as either a notified item or RCC.

Having considered the representations, we have concluded that for our final determination notified items are required for:

- increases in household bad debt and debt management costs resulting from worsening economic circumstances in a company's operating area (see section 4.9.3);
- increases in the environmental improvement unit charge component of abstraction charges above the retail price index to cover the compensation costs of the Environment Agency's Restoring Sustainable Abstraction programme (see section 4.9.8);
- increased costs necessary to balance water supply and demand, based on companies' application of UKCP09 data and appropriate analytical tools and processes (see section 4.4.1); and
- costs associated with the impact of the introduction of permit schemes made pursuant to the Traffic Management Act (see section 4.9.7).

We have also concluded that a company-specific notified item is required for Thames. The notified item is for the acquisition of land for the Thames tunnel component of the London Tideway Tunnels (see section 3.2.14).

We also expect costs related to the following issues to qualify as RCCs:

- Competition, where costs arise from changes in companies' legal requirements (see section 4.9.5).
- The adoption of private sewers (see section 4.9.6).
- Work related to implementation of the Water Framework Directive.
- Urban Wastewater Treatment Directive legacy.

Other issues that meet the criteria set out in the companies' licences for RCCs and apply directly to the companies in their capacity as undertakers will be treated as such in any interim determination.

For our final determinations, we concluded that it was not appropriate to allow notified items in some of the areas that the companies wanted. We provide further explanation in section 4.9 but in general, if we have not allowed notified items it is because we:

- have already taken account of the relevant factor in price limits; or
- we have judged the risks to be either covered by indexation or to be part of normal business risk, which is reflected in the cost of capital.

We expect companies to use their management skills to mitigate these risks.

5.3.2 Substantial effect clause

The substantial effect clause is part of the package of regulatory mechanisms that help to reduce the risks that companies face. It allows companies, or Ofwat, to seek revised price limits if a circumstance changes beyond a prudent company's control and if the total adverse or beneficial impact on the company amounts to at least 20% of the company's turnover.

Earlier this year, Sutton & East Surrey asked us to refer our determination of its substantial effect application to the Competition Commission. Our determination, published in December 2008, considered the particular facts relevant to the company's case. It followed a two-stage approach.

- First, we considered whether each circumstance exceeded the materiality threshold of 20% of the company's turnover and would not have been avoided by prudent management action.
- Second, having established that the materiality hurdle was cleared, we assessed whether an adjustment to price limits was necessary. In making this assessment, we considered our duties under section 2(2A) WIA91. In this particular case, we concluded that the company could finance the proper carrying out of its functions until at least the start of the next five-year period on 1 April 2010 when the new price limits come into effect.

Sutton & East Surrey appealed our decision and since our draft determinations, the Competition Commission has published its final decision. As we had done, the Competition Commission also decided that an adjustment to price limits was not necessary. It agreed with our current approach that exceeding the materiality threshold did not itself mean that price limits should be increased. It stated that the materiality threshold was a test of jurisdiction which, once passed, required us to assess whether prices should be adjusted within the framework of our section 2(2A) WIA91 duties.

The Competition Commission also considered whether the impact of multiple circumstances could be aggregated in order to meet the materiality threshold. It decided that aggregating the impact of individual circumstances in this manner may be appropriate. Although this has not been an issue for any of our substantial effect clause

determinations, we had indicated previously that we would not aggregate circumstances in this way.

In future, when determining whether a substantial clause application meets the materiality threshold, we will consider aggregating the impact of individual circumstances. All other aspects of our general approach to the substantial effect clause remain as set out in our final determination of Sutton & East Surrey's application.

In their representations, some stakeholders commented on the substantial effect clause, its role and the impact of the Competition Commission's final decision on it. Some thought that our draft determinations placed an increased reliance on the clause as a mechanism for dealing with risk. Some considered that, following the Competition Commission's decision, the substantial effect clause's value as a risk mitigant had reduced and had become a test of insolvency of little value to equity investors.

The principles we applied to Sutton & East Surrey's application were consistent with those we set out in our Northumbrian and Bournemouth & West Hampshire substantial effect determinations, which we made in 2003-04. With the exception of the approach to aggregation described above, our approach to the substantial effect clause remains the same as when we made our final determinations of price limits in 2004. We do not consider that our draft or final determinations rely on using the substantial effect clause more than previous determinations. We believe that the balance of risk in the final determination package makes the use of the substantial effect clause no more likely than in previous price review periods.

In assessing Sutton & East Surrey's application, we considered both the level of the return on capital and the level of the financial ratios, not just the financial ratios themselves. We considered whether the ratios were consistent with maintaining investment grade status until we reset prices and the wider context within which the application was made. Considering whether a company's financial ratios are consistent with investment grade is not equivalent to using an insolvency threshold.

A key concern of stakeholders continues to be how we would take account of a prolonged period of deflation, driven by the current financial and economic conditions. In our draft determinations, we explained that the substantial effect clause does not define what a 'circumstance' is (beyond excluding issues that qualify as RCCs). We said that it was clear that the level of RPI is beyond a company's control and that as a result, companies could make an application under the substantial effect clause if they believed the impact of deflation on its costs and revenues was demonstrably at least 20% of turnover and would not have been avoided by prudent management action. As we do in all such cases, we said that we would consider each case on its own merits with reference to the facts relevant to the case.

Some stakeholders interpreted this to mean that we were placing more reliance on the substantial effect clause for the coming five-year period. As explained above, this is not

the case. At draft determinations, we simply sought to provide clarity to stakeholders on a specific issue of concern to them. Section 5.4.1 describes the particular impact of deflation on water companies' financial projections.

Price limits provide some protection for companies against deflation because they include assumptions on trends in wider macroeconomic factors, including inflation. Our final determinations reflect current forecasts and assume a period of deflation in 2009-10 that flows through to customers' bills in 2010-11 followed by a return to positive inflation. This is set out in section 5.11. We have also tested the sensitivity of our price limits to certain factors, including inflation, as set out in section 5.6.

5.4 Financing functions

We have a primary duty to ensure that efficient companies can finance their functions. In section 5.2 of our methodology paper, we set out how we interpret this duty. We said we would set a cost of capital for the industry within the framework of the capital asset pricing model (CAPM), taking account of how we have considered risk in all aspects of the price limit package. We also said that we would ensure price limits provide for efficient companies to be financeable, such that a company's revenues, profits and cash flows are sufficient to allow it to raise finance on reasonable terms.

5.4.1 Context

Since the onset of the credit crunch in August 2007, we have seen a number of failures in the banking system, followed by a period of significant volatility in the financial markets and the onset of recession. While the markets have improved since our draft determinations, significant uncertainty remains over the extent and nature of the recovery.

The perception of risk in the industry relative to other sectors is a key factor in determining companies' ability to raise finance at reasonable rates. Water UK's 2009 investor survey found that investors continue to see the industry as low risk compared with the wider market. However, investors did not consider the industry immune from deteriorating financial and economic conditions more generally. Although it continues to be relatively low risk, recent market conditions highlight the need for the companies to maintain good credit quality to enable capital programmes to be delivered at an efficient cost. In particular, we acknowledge the risk to customers of making too low a cost of capital assumption.

The companies have shown relative robustness to the recent challenging economic and financial difficulties. They have continued to access debt markets, albeit at higher prices than in the period before the start of the credit crunch. We acknowledge that market conditions present difficulties in making forward economic projections and introduce

uncertainty in estimating the components of the cost of capital, although we have seen a reduction of volatility in the equity markets in recent months.

However, as discussed in section 5.3, our approach to regulation includes risk mitigations that limit the effect of this uncertainty and we consider it is important to companies, their investors and consumers that we provide certainty for the five-year price review period. This is a low risk industry with a well understood, tried and tested package of risk mitigating measures that provide additional protection to investors in uncertain times.

We have also considered the potential impact of a prolonged period of deflation in reaching our conclusions on the price setting package. The effect of deflation on the companies depends on a number of factors. The timing of deflation is important because of its differential impact on:

- cash payments;
- cash receipts; and
- the ability of companies to raise debt finance against the value of the RCV.

Deflation affects companies in different ways because of their capital structure. In particular, companies with relatively low proportions of index-linked debt embedded in their balance sheets suffer most in a period of deflation. This is because the cash interest payment will comprise a relatively greater proportion of cash flow from operating activities than in an inflationary period.

The overall impact on a company's ability to finance its functions as a result of deflation critically depends on how long it lasts and the depth of it. The inflation assumptions within our final determinations reflect current forecasts. These include a deflationary assumption for the latter part of 2009, followed by a return to positive inflation. To the extent that the deflationary environment differs materially from the assumptions included in price limits, the substantial effect clause offers protection to companies as set out in section 5.3.2.

5.4.2 Cost of capital

In coming to our judgement on the cost of capital, we have considered the price setting package as a whole. This includes:

- an assessment of the return needed by investors and lenders to compensate for their exposure to systematic risk;
- company-specific risks, which are included in our cost and revenue assumptions; and
- the risk sharing mechanisms within the regulatory regime.

Water and sewerage companies' estimates of the cost of capital in their final business plans fell within a narrow range of 4.7% to 5.0% on a real, post-tax basis, with one company (Thames) above the range at 5.25%. The range for the water only companies was wider at 5.45% to 6.3%, largely because of the different views on the size of the small company premium they consider is required.

Most companies determined their proposed cost of capital from a study by National Economic Research Associates (NERA), that Water UK commissioned. In some cases, the companies supplemented this with their own analysis. NERA's estimate of the post-tax cost of capital in its January 2009 report was in the range 4.6% to 5.1%, based on gearing of 60%. NERA did not update its cost of capital estimate in its August 2009 report despite the significant easing of the financial markets since January 2009. However, it did calculate a revised range for the current cost of equity since the start of the credit crunch and recommend an overall cost of debt at the low end of its previously proposed range at 3.8%.

We settled on a cost of capital of 4.5% for our draft determinations. We considered this to be appropriate assuming a central view of costs and a balanced view of risk. We have considered carefully the representations we received on our draft determinations that focused on the balance of risk. We comment on this further in section 5.6. We have also considered carefully the balance of risk within our final determinations. In light of this, the weighted average post-tax cost of capital for the final determinations remains at 4.5%. This is below the level set at the 2004 price review (5.1%), but is towards the high end of the range supported by our advisers (Europe Economics).

We have set out range estimates from Europe Economics' report and the components of our point estimate in tables 45 and 46 respectively. Although we have stated the component parts of the cost of equity in the tables, we consider it is most relevant to focus on the overall cost of debt and cost of equity.

In reaching our cost of capital assumption, we considered, among other evidence:

- the updated advice of Europe Economics;
- NERA's work (on which most companies appeared to base their proposals);
- market evidence since draft determinations;
- company representations on our draft determinations; and
- we have reviewed an updated consultancy report on the cost of capital that CCWater commissioned.

Table 45 shows a range estimate for the cost of debt of 2.5% to 4.7% compared with NERA's range estimate for the cost of debt of 3.8% to 4.3% (based on a 30:70 split of current and historic debt costs). NERA's proposed cost of equity ranged from 7.4% to 8.2%. The cost of equity was driven by a dividend growth model assessment as this overlapped with the high end of NERA's CAPM assessment.

In its advice, Europe Economics provided a 'marked up' range to take account of asymmetric consequences associated with the risk to customers of setting the cost of capital too low. This mark-up was applied to the overall cost of capital, not individual components. We show Europe Economics' marked-up range (2.9% to 5.4% on a post-tax basis) for the cost of capital in table 45. The width of the range reflects the uncertainty around estimating the cost of capital, particularly in the context of the current markets.

Europe Economics produced its point estimate within its range after further analysis based on a weighted assessment of two separate cost of capital point estimates. It provided a point estimate of 4.3% for a cost of capital based on current market data and a cost of capital representing its best view on where the market may settle as the current constraints in credit markets ease. Europe Economics' report on the cost of capital for our final determinations and accompanying briefing notes are available on our website.

Table 45 Europe Economics' range for the cost of capital for the water industry

	Low	High
Gearing (debt: RCV)	55%	65%
Cost of equity		
Risk-free rate	1.5%	2.2%
Equity beta	0.5	0.9
Equity risk premium	4.1%	5.4%
Cost of equity (post-tax)	3.5%	7.2%
Cost of debt		
Cost of debt (gross of tax shield)	2.5%	4.7%
WACC – gross of tax shield (Vanilla)	**2.9%**	**5.6%**
WACC – post-tax	**2.5%**	**4.7%**
Marked-up WACC to account for the asymmetry of consequences		
WACC – gross of tax shield (Vanilla)	**3.4%**	**6.4%**
WACC – post-tax	**2.9%**	**5.4%**

While we have not chosen to distinguish between different market conditions or apply an explicit mark-up, we believe our cost of capital set out in table 46 is supported by the range of evidence and analysis set out in the Europe Economics report. It will enable efficient companies to maintain access to the capital markets throughout 2010-15 and beyond. But as stated above, we consider it most relevant to consider the overall cost of debt and the overall cost of equity rather than to focus on individual components.

Table 46 The weighted average cost of capital for the water industry

Gearing (debt: RCV)	57.5%
Cost of equity	
Risk-free rate	2.0%
Equity beta	0.9
Equity risk premium	5.4%
Cost of equity (post-tax)	7.1%
Cost of debt	
Cost of debt (gross of tax shield)	3.6%
WACC – gross of tax shield (Vanilla)	**5.1%**
WACC – post-tax	**4.5%**

5.4.3 Cost of equity

The weighted average cost of capital includes a 7.1% post-tax cost of equity derived from measurements of the risk-free rate, equity risk premium and asset beta estimates. Our final determination cost of equity is at the high end of the Europe Economics pre-marked-up range (3.5% to 7.2%), but we believe that it is necessary to allow the industry to maintain access to finance in difficult economic times. This takes into account general expectations that current economic conditions will continue in the early part of 2010-15 and the need to ensure the cost of equity is sufficient to both keep equity in the sector and attract new equity.

We have presented our assessment of the cost of equity in the context of CAPM. The assumptions that underpin the assessment are:

- **A risk-free rate of 2.0%.** This is below the 2.8% we assumed at the last price review. It is well above the current spot rates for index-linked gilts but consistent with the view that the risk-free rate is expected to increase in the medium term. It is also consistent with the ten-year long-run historic UK index-linked gilts of five- and ten-year maturity and consistent with recent regulatory determinations.

- **An equity beta of 0.9.** Our equity beta of 0.9 at the 57.5% notional level of gearing derives from an asset beta of 0.4. These assumptions are at the high end of Europe Economics' beta observations, but reflect the fact that we are setting price limits at a time of market uncertainty. This is lower than the equity beta of 1.0 implied in our 2004 determinations.

- **An equity risk premium of 5.4%.** This is above the figure we used in 2004 and is at the high end of the pre-marked-up range proposed by Europe Economics (itself based on Dimson Marsh and Staunton series data for the long-term equity risk premium). It reflects our view that we should assume a high equity risk premium given the economic conditions within which the cost of capital is set and

is at the top of the historical range. Recent analysis suggests an expectation that the future long-run risk premium will be less than the historical average.[2]

In their representations to our draft determinations, most companies raised concerns with the cost of equity. Companies that commented on the cost of equity were concerned that the market reaction to our draft determinations suggested the cost of equity was too low. They suggested that the post-tax cost of equity:

- was lower than could be supported by long-run historical evidence; and
- did not reflect the impact of the recession on required equity returns to compensate for increased market risk.

Some companies, based on arguments put forward by NERA, considered that the risk-free rate was downwardly biased as it was calculated using index-linked gilts rather than swaps.

We have considered the arguments put forward by the companies and NERA. But we note that the cost of equity is towards the high end of the pre-marked-up range proposed by Europe Economics. In their response to NERA's critique of our draft determinations, Europe Economics set out persuasive arguments that support our general approach to calculating the risk free rate using index-linked gilts.

In our methodology paper, we were clear that we would set the cost of capital using the CAPM framework, but that we would cross check using other models, including the dividend growth model (DGM).

We noted in our draft determinations that NERA's longer-term range of 7.4% to 8.2% for the cost of equity does not factor in historic evidence and relies more heavily on analysts' forward projections. NERA provided an updated estimate of its DGM derived cost of equity in its August 2009 report of 7.9% to 10.6%. This was calculated using current data, since the start of the credit crisis. NERA considered this to be of particular importance for companies that need new equity to finance their capital investment programme.

Europe Economics' DGM range for the cost of equity was 5.6% to 7.7% based on actual levels of gearing. We have published on our website the additional DGM analysis Europe Economics prepared in response to NERA's review of our draft determination financial assumptions. Europe Economics' analysis provides a range of outcomes, all of which encompass our cost of equity.

A key difficulty with the DGM is the need to make an estimate of the future dividends expected by investors. Europe Economics' view was that we should be particularly cautious about placing weight on DGM estimates calculated during a period of financial

[2] See Dimson, Marsh and Staunton 2009. Credit Suisse Global Investment Yearbook 2009.

turmoil because analysts' forecasts of the absolute amount of future dividends are likely to be biased upwards when share prices are falling. In addition, Europe Economics advised that DGM projections which relied on proxies for analysts' forecasts may not accurately reflect investors' expectations of long-run dividend growth for a particular company. Therefore, we have not placed particular weight on a DGM-derived cost of equity in our final determinations.

We assume the same cost of equity for those companies where we have assumed an equity injection. This is because the new equity is to support RCV growth for companies operating under a stable regulatory regime. This is consistent with the view expressed by Smithers (2006) that where equity issuance assumed by the regulator is to maintain gearing, the informational problem which may otherwise require increased equity returns, largely disappears.

The updated work for CCWater gave a range for the cost of equity of 4.5% to 5.0%. The consultants take a different view on the risk-free rate, which is based on a more current assessment than the longer-run averages we have assumed. The consultants also use a lower equity risk premium of 3.9% to 5.0% than has been assumed in any of the other evidence presented to us.

5.4.4 Cost of debt

Consistent with our draft determinations we have assumed a real cost of debt of 3.6%. In doing so, we have drawn on direct observations from companies' existing debt portfolios and forward projections. The cost we have assumed for existing debt is 3.4%. Our forward-looking cost of debt is 4.1% to 4.3%. We have factored into this assessment the mix of existing debt that will remain in place over 2010-15, together with the new financing and refinancing requirement. At an industry level, we have assumed that the ratio of existing debt to new debt is 75:25.

Companies did not raise significant concerns with the cost of debt in their representations. Where companies did comment, they made comments consistent with NERA's work that there are likely to be upward pressures on the cost of debt in the short and medium term as a result of the economic outlook, likely volume of gilt issuance and the unwinding of quantitative easing.

In the bond markets, 2009 has seen very significant bond issuance in the UK and European markets. Bond spreads have tightened significantly since January 2009 and spreads appear to have levelled off since August. Our forward-looking cost of debt of 4.1% to 4.3% factors in that market conditions remain uncertain and a cautious view that conditions in the markets could continue to be difficult during 2010-15. It is lower than the more cautious forward-looking cost of debt that NERA propose.

Europe Economics' advice on the cost of debt focused on the cost of new and refinanced debt. This is not directly comparable to the cost of debt we set, as we have calculated it differently.

In concluding on the cost of debt, we have also drawn on the evidence from the markets regarding the apparent limited appetite for index-linked debt. Although there has been some evidence that companies are continuing to access limited amounts of index-linked debt, we have continued to assume no new issuance of index-linked debt. However, we expect that the companies will continue to be able to access EIB debt as a relatively competitive source of debt finance.

Our forward-looking cost of debt ensures that efficiently financed companies, with efficient treasury management, are able to maintain a balanced portfolio of debt, including access to debt at a range of maturities to meet their financing requirements.

We have set the cost of debt at a level that allows companies to meet transaction costs, commitment fees and costs associated with the maintenance of an appropriate level of liquidity. We calculate these costs to be 0.2% on the cost of debt overall, factoring in a view of these costs under current and more benign economic conditions.

The work commissioned by CCWater gave a range for the cost of debt of 2.2% to 2.7%. Its advisers take a different view on the risk-free rate. This is based on a more current assessment of the risk-free rate than the longer-run averages we have assumed.

5.4.5 Gearing

In setting the cost of capital, we have assumed a level of gearing that is appropriate for the industry. We consider that the range 55% to 65% continues to be a sustainable level of gearing to ensure companies remain comfortably within the investment grade category.

In setting price limits, we have adjusted the companies' opening balance to 57.5% gearing. We consider this is the appropriate level as:

- it is broadly consistent with the closing notional level of gearing for the industry we assumed at the last price review, which assumed retention of cash flows to address financeability constraints, and does not therefore imply an equity injection to the opening balance sheet; and
- our gearing assumption accounts for the opposing effects of deflation and financing efficiencies achieved by companies in 2005-10. Deflation can act to decrease the value of the RCV and therefore increase gearing because of the effect of nominal debt. On the other hand, it is reasonable for customers to assume that a company has retained some of the financing efficiencies achieved through lower cost debt achieved in the market conditions that prevailed in the period 2005 to 2007.

5.5 Small companies

All of the water only companies argued for a small company premium. Their views were based largely on work that NERA carried out, which the water only companies submitted with their business plans and updated in response to our draft determinations.

Arguments in favour of the small company premium focused on three main ideas.

- Small companies have access to less competitive and more limited sources of finance and are therefore more exposed to risks associated with the cost of debt finance.

- The need to compensate the cost of equity for the illiquidity of trading shares in smaller companies.

- Small companies face greater systematic, financial and asymmetric risks that increase the cost of equity.

The smaller companies and NERA also argued that water only companies needed to exhibit healthier financial ratios in our financeability assessment as they are more exposed to asymmetric risks, for example:

- cost overruns on single projects;
- higher revenue concentration risks; and
- greater exposure to event risks.

In its response to our draft determinations, NERA repeated many of these arguments in its report on the small companies.

There is evidence that small companies face different challenges to larger water companies in accessing debt. Therefore, there is a need for a small company cost of debt premium. Access to debt finance is more limited for water only companies. We observe that only the two largest water only companies have been able to issue conventional bonds directly into the market.

EIB debt is currently not available for direct issuance to water only companies (but only because of constraints on minimum levels of lending). Market difficulties may mean that finance from innovative arrangements such as Artesian finance, which has involved monoline insurers, is not currently available and is unlikely to be available in the near future. In addition, NERA's analysis suggested that water only companies rely more heavily on bank debt that has a cost disadvantage compared with conventional bond market debt.

Our determinations include a small company cost of debt premium of 0.1% for the two largest water only companies and 0.4% for all of the other water-only companies. The

assumptions are at the low end of the range presented by NERA. The assumption for the largest two water only companies factors in a view that these companies will be able to continue to access conventional bonds in the future.

In response to our draft determinations, NERA argued that at the lower end of its proposed range assumed future issuance of Artesian finance which, as noted above, may not be available. While Artesian finance may not be currently available, that does not mean alternative financing arrangements may not arise for small companies in the future.

We found the arguments put forward for a small company cost of equity premium in respect of illiquidity in trading costs to be less robust or clear. We consider it is more relevant to consider the cost of equity for the small companies in respect of their exposure to systematic risks as this is consistent with the CAPM approach.

NERA's advice to the water only companies, for its representation on our draft determinations, supported a higher cost of equity premium based on the premise that water only companies face higher relative systematic (beta) and cash flow (financial and asymmetric) risks than water and sewerage companies. This resulted in a significant increase in the overall small company premium proposed in the final business plans when compared with the evidence presented:

- for the draft business plans. and
- when the small company premium was set at the 2004 price review.

Systematic risks are relevant to the cost of equity. These risks include:

- input price risk;
- the impact of operational leverage; and
- demand and revenue risks.

In particular, NERA argued that revenue shocks, including revenue shortfalls and the impact of bad debt, have a greater impact on water only companies because profits are a smaller proportion of the cost structure of these companies.

The revenue correction mechanism introduced for this review removes any risk associated with household demand, limiting any difference in systematic risk to demand from large users. For most water only companies, the proportion of revenue from large users is comparable to the range for the water and sewerage companies.

While concentration of revenue risk to individual customers may be greatest for water only companies, we consider this a company-specific risk. In the event of the loss of a large customer to a water company, then we would need to consider the impact of this in relation to our duty to enable efficient companies to finance their functions, and the

package of the risk mitigation measures available to the regulatory framework, which we discuss in section 5.3.

NERA suggests that increases in bad debt associated with a downturn in the business cycle will affect water only companies more than water and sewerage companies because of their cost structure. This evidence does not convince us. Our historic assessment of bad debt suggests water only companies have been in a position that is no worse than the water and sewerage companies. While we have not made an assumption of higher future operating expenditure for bad debt for any company, we have considered bad debt on a company-specific basis when assessing relative efficiency and, for our final determinations, we have introduced a notified item for bad debt for all companies.

Europe Economics advise us that the analytical basis for a difference in systematic risk between water only and water and sewerage companies is not sufficiently strong for us to justify a difference in systematic risk between categories of companies. We do not consider the evidence presented is sufficient for us to conclude a different approach is required for systematic risk in respect of the water only companies.

Company-specific risks are those that can be diversified by investors. As a result, they are not captured by the beta factor (and hence the cost of equity). The main credit rating agencies present a consistent view that smaller companies are higher risk because of their exposure to specific risks, which includes:

- higher asset concentration;
- higher revenue concentration; and
- exposure to event risks.

These are not risks that impact on the CAPM-derived cost of capital as such. This is because the CAPM model assumes that investors diversifying their investments can offset specific risks affecting an individual firm. However, these are risks that have potential consequences on the cash flows of the water only companies should these risks occur. Therefore, the rating agencies require more headroom in cash flows for water only companies to take account of these risks. We have recognised the overall impact of specific risk on the water only companies in our gearing assumption and in the financeability assessment that we describe below.

5.5.1 Gearing assumption for small companies

Traditional corporate finance theory suggests that if a particular company is exposed to relatively greater risks (whether systematic, financial, specific or in combination), then it is appropriate to adopt a more conservative gearing structure to provide headroom to manage these risks. We have considered the arguments of small companies about specific risks, but we do not consider these clear cut. However, on balance, and given the rating agencies' approach, we consider that because the small companies may have

higher exposure to specific risks, it is appropriate to assume a 5% differential in gearing between water only companies and the water and sewerage companies.

Therefore, we have adjusted the opening gearing for the water only companies by 5% from our general gearing assumption of 57.5% (that is, 52.5%). This is consistent with the differential in the average level of gearing between water only companies and water and sewerage companies observed for their actual financial structures.

In their representations, some of the companies, based on an argument put forward by NERA, suggested that for a given level of leverage, water only companies should be able to demonstrate superior coverages in their financial ratios than water and sewerage companies in order to achieve the same credit rating. In practice, some water companies, particularly the highly geared ones, have achieved 'superior coverages' through issuing significant proportions of index-linked debt. This does not translate to a need for a different treatment for the water only companies in price setting.

We have not assumed a different proportion of index-linked debt in our capital structure between water only and the water and sewerage companies.

The overall cost of capital for water only companies is set out in table 47. We have maintained the cost of equity that we have used at the industry level in our cost of capital calculation to improve the cash flows of the water only companies. This cost of equity is higher than it might otherwise be under a CAPM approach at 52.5% gearing, as we have not adjusted the equity beta for the water only companies.

Table 47 The weighted average cost of capital for small companies

Companies	Weighted average cost of capital		Equity	Debt	
	Gross of tax shield (Vanilla)	Post-tax	Post-tax	Pre-tax	Post-tax
South East Water, Veolia Central	5.3%	4.8%	7.1%	3.7%	2.7%
All other water only companies	5.5%	4.9%	7.1%	4.0%	2.9%

5.6 Financeability

We have described a company, if reasonably efficient, as financeable if its revenues, profits and cash flows allow it to raise finance on reasonable terms in the capital markets. We have assessed financeability by calculating a wide range of financial ratios used by the rating agencies and the wider financial community.

We have discussed the approach to assessing credit ratings with each of the main rating agencies. As for previous price reviews, there is no single set of ratios that captures the approach of the rating agencies. The agencies emphasise that their ratings are based on a broad assessment of each company individually, not just quantitative ratios.

Table 48 sets out the five key ratios against which we have considered the price limit package. We have also considered dividend cover as a key ratio for equity investors, but we have not set a specific target level as it is for the companies to determine their own dividend policies. We also considered accounting interest cover ratios on an historic and current cost basis. Our discussions with the credit rating agencies informed this approach.

Table 48 Key financial indicators

Ratio	WaSCs	WoCs
Cash interest cover (funds from operations: gross interest)	About 3 times	About 3.5 times
Adjusted cash interest cover (funds from operations less capital charges: net interest)	About 1.6 times	About 1.8 times
Funds from operations:debt	About 13%	About 17%
Retained cash flow:debt	About 8%	About 10%
Gearing (net debt: regulatory capital value)	Below 65%	Below 60%

It is important for customers that investors and markets continue to see that the companies maintain a good quality credit rating, especially given the need for the industry to finance a significant investment programme and to refinance existing debt. This is particularly the case where the financial markets are more volatile. Water companies and other utilities have taken advantage of issuance windows as they have arisen to finance liquidity. As a result, most water companies are currently able to demonstrate they are pre-financed into the early part of the 2010-15 period, but given the size of the investment programmes, it is important that these companies are able to continue to access finance on reasonable terms.

In their responses to our draft determinations, investors and the companies raised particular concerns that the overall package put greater risk on companies and their equity investors leaving little scope to achieve or outperform the cost of capital. We comment on the risk sharing mechanisms as a whole in section 5.3.

For our final determinations, we have looked again at our assumptions on costs and revenues in light of the representations. This has resulted in:

- upward revisions to costs allowed in price limits where outputs have not changed;
- downward movement in the CIS ratios
- revised revenue assumptions; and

- the introduction of notified items for bad debt and certain elements of abstraction charges.

These changes to cash flows have reduced risk for companies and their shareholders compared with our draft determinations. We discuss the items that have changed in chapter 4. Some stakeholders also identified the CIS mechanism as a particular issue that increased risk to the industry. We think these concerns are unfounded. In considering the CIS mechanism, companies and other commentators have assumed no outperformance of the determination capital expenditure assumptions. We explain in appendix 5 why it is important to consider the scope for capital expenditure outperformance. We also provide an illustration that compares the return on equity using a combination of realistic ex-ante and outturn assumptions under the PR09 CIS approach and the PR04 frontier approach to determining capital expenditure.

As in previous price reviews, we have carried out a financeability assessment to ensure financial projections were comfortably within the investment grade range. We carry out the financeability assessment before adjusting for incentive mechanisms such as:

- the OPA;
- CIS additional income;
- shortfalling adjustments; and
- operating expenditure and capital expenditure outperformance.

This is so that the incentives brought about by these mechanisms are preserved. In their representations, some companies said that we should carry out the financeability assessment after these adjustments if we were to meet our duty to secure that the companies are able to finance their functions. Table 49 shows the aggregate adjustments included in our final determinations for each of these incentives.

Table 49 OPA and revenue adjustments

(£m)	2010-15
OPA adjustment	-75
CIS – additional income	-136
Shortfalls	-91
Operating expenditure outperformance	77
Capital expenditure outperformance	48
Total	**-178**

The current financial environment means we need to be more explicit with the level of the package of financial ratios. For our final determinations, at the point at which we consider financeability, we have targeted financial ratios under our notional structure that are consistent with an A-/A3 credit rating. Most companies are in this position.

If one particular indicator (and in a small minority of cases, two key indicators for one rating agency) does not meet our required threshold, we ensure that it meets the criteria for a strong BBB+/Baa1 credit rating as a minimum. Our approach is consistent with a view expressed to us that the capacity of investors to invest appears to be less sensitive to the difference between high BBB and low A range ratings where utilities are concerned. Our approach is consistent also with our cost of debt where we have set a range for the forward-looking cost of debt.

We have also tested our final determinations package against some realistic downside scenarios to ensure that our cost of capital and the risk mitigation measures represent a balanced approach to risk given the uncertainties.

We recognised in section 5.5 that the credit rating agencies require greater headroom in cash flows for water only companies to account for the impact on cash flows of specific or asymmetric risks. Therefore, we have increased the thresholds for the water only companies.

The credit rating agencies make a number of adjustments to company data in their assessment of the financial ratios. In response to our draft determinations, some stakeholders considered we should also make these adjustments in calculating our financial ratios.

For our final determinations, we have revised the cash interest cover ratio to be on a gross rather than a net basis. This ensures consistency with the calculations made by the credit rating agencies. We have been clear that we model assuming a capital structure based on our gearing assumption; accordingly, it is inappropriate that we should make specific adjustments associated with companies' actual financial structures. Neither do we adjust for pension deficits. Although the credit rating agencies make pragmatic adjustments for pension deficits at a point in time, deficits can be volatile, and the companies can manage pension deficits to some extent. However, the financial ratios we calculate fully reflect the cash contribution of deficit funding assumed in price limits.

5.6.1 Assumptions on interest costs in modelling financial projections

We have modelled interest costs that are consistent with our real cost of debt assumption in the cost of capital.

For fixed and floating rate debt, we have assumed interest is paid on a nominal basis, so the annual interest receipts compensate investors for inflation. Annual measures of RPI may be volatile, as is currently the case for forward projections. We have therefore assumed the nominal interest rate includes a longer-term view of inflation. We have modelled an interest rate of 6.2% (that is, 3.6% real and our assumption of investors' long-term view of inflation of 2.5%).

Index-linked debt has a beneficial impact on the financial position of the companies because it has an interest cost that reflects a real rather than a nominal rate of interest. The indexation of the principal to RPI compensates investors for inflation.

Consistent with the approach stated in our methodology paper, we have assumed that 30% of gross debt in the opening balance sheets is index-linked debt. This is broadly consistent with the proportion of total debt held by companies from the direct issuance of index-linked debt. This is the case irrespective of whether the company has a conventional or highly geared structure. While some companies have a greater proportion of index-linked liabilities, they have accessed these by the use of swaps, which is a feature of the highly geared companies.

Although there has been some issuance of index-linked debt since our draft determinations, evidence of market appetite for the issuance of new index-linked debt remains limited. While companies may be able to acquire index-linked debt either by direct or indirect means as market conditions improve, we have not assumed any future issuance in the early part of 2010-15.

Although one of the rating agencies has adopted a policy of excluding the benefit from index-linked debt in its quantitative ratio assessment, we understand it has factored in the benefit of index-linked debt to its qualitative assessment. This specifically affects the 'funds from operations' FFO:debt ratio. We do not make this adjustment and the threshold for the ratio is consistent with this. We have continued to assume the cash interest cover ratios should be set to allow companies to pay cash interest liabilities. Despite this, we have checked the ratio in our financeability assessment using the credit rating agency definition against the levels for the cash interest cover ratio stated in table 42.

5.6.2 Equity investment

In our methodology paper, we highlighted that equity injections, including the issuance of new equity and retained earnings are viable options to ease a financing constraint.

We do not regulate dividends as part of our regulatory framework. It is for management and investors to decide a company's dividend policy. Nevertheless, we need to make some assumptions about dividends for the purposes of modelling cash flows.

We have used a dividend yield of 5% (about 70% of the cost of equity). This implies dividend growth of 2.1% given the cost of equity. The dividend yield is consistent with the view of the industry as an income stock. The dividend yield is lower than for the 2004 price review as we consider equity retention to be an important part of the way forward necessary to ease a financing constraint. The growth assumption for the period 2010-15 is broadly consistent with the GDP growth calculated from the average of independent forecasts of GDP (published by HM Treasury) for the period until the end of 2013 and the Government's forecasts of long-term growth beyond then.

We remain of the view that equity injections or rights issues are legitimate means of easing the financing constraint brought about by continuing large capital programmes. This is particularly the case where new equity supports RCV growth for a company operating under a stable regulatory regime. Three companies (Thames, Bristol and South East) had weaker financial ratios in our financeability assessment at our cost of capital. These companies have the largest RCV growth assumption in 2010-15 and as a result, weaker financial ratios arise. Accordingly, in our financial modelling for Thames, Bristol and South East we have assumed equity injections amounting to 20%, 10% and 7.5% of opening notional equity respectively to relieve the financing constraint.

For these three companies, we also included an allowance to recognise the transaction costs associated with the cost of new equity issuance, calculated as 5% of equity raised. NERA, in its advice to Water UK, suggests transaction costs associated with equity issuance are estimated to be about 5%. This is consistent with evidence elsewhere, including for example, Smithers' report for Ofgem.

Ultimately, it is for the companies and their investors to determine how best to finance the investment programme in reaction to the overall price limit package. It is possible that the debt markets could recover such that companies will be able to issue index-linked debt either directly or through swap arrangements. This would be an alternative means of easing the financing constraint. If these companies are able to issue more index-linked debt, consumers will not be disadvantaged. This is because we will recover the costs we have assumed for the issuance of new equity at the next price review in the event that the company does not issue equity in the period 2010-15 to finance the investment programme,

The dividend yield we have assumed for the issuance of new equity is consistent with that on existing equity. This is consistent with the view that the purpose of the new equity is to fund growth of the RCV.

5.7 Taxation

Profits need to be sufficient to remunerate investors and lenders, but they also need to cover business taxes. The financial projections show effective current tax rates of about 16% for the industry. This reflects the relatively high gearing of the industry as a whole and its capital intensive nature. For most companies, the impact of tax payments on customers' bills is lower over the period 2010-15 than in 2005-10. This is primarily because of a reduction in the allowed rate of return and hence our projections of operating profit and a lower corporation tax rate (28%) than at the last price review.

We set out our approach to calculating tax in respect of the tax shield on interest payments in our methodology paper. In summary, for companies with actual gearing above the level underpinning the cost of capital, we have calculated tax based on the companies' actual gearing projections in their business plans. For companies whose business plan gearing projections are below 57.5%, we have calculated their tax calculated on the basis that they had geared up to 57.5%.

Companies with relatively low levels of gearing raised concerns that our policy would disadvantage them as it would prevent them from recovering sufficient revenue to finance their functions in circumstances where the company is not able to match the assumed gearing level.

We interpret our duty to ensure companies can finance their functions to mean that price limits will allow an efficiently financed company to deliver its services to consumers and earn a return on capital, on average, at least equivalent to the cost of capital.

Our policy on the approach to tax brings it into line with our assumption on gearing. It is just one policy within the price setting package. It is for the companies, their shareholders and management to determine the most efficient financing structure to meet their circumstances within the price setting package. In addition, our approach to tax is consistent with other regulators, for example the approach adopted by Ofgem for its 2004 and 2009 electricity distribution reviews.

We have tempered the impact through our assumption of lower notional gearing for the small companies. In reality, this has affected just one water only company for our final determinations.

5.7.1 Tax and uncertainty

In their representations, companies continued to raise two specific areas of uncertainty about taxation.

Impact of future changes in accounting standards

About half the companies have asked us to retain a notified item for changes in the timing of tax deductions because of future changes in accounting standards. The change will arise when UK accounting requirements are amended to align with international accounting standards. Most of the companies who have raised this issue are concerned about the impact of changes in accounting for infrastructure assets.

Since we published our draft determinations, the Accounting Standards Board has published more information about the likely timing of this change for consultation. Although the proposed date for changes is now 2012 (that is, it would first occur for water companies in 2012-13 accounts), this is not yet final. Two companies have adopted international accounting standards since we last set price limits. Neither company has asked us to carry out an interim determination because of this change.

We have not made any assumption in our final determinations for this change. Nor have we included a notified item. Although it is possible that additional tax may arise because of changes to accounting standards, this will be heavily influenced by each company's choice of accounting policies. Companies can therefore take steps to manage the tax implications of such a change. In addition, the tax impact of the accounting changes may not be wholly adverse. Expenditure for which companies do not currently receive any tax relief may attract a deduction for tax purposes under the new accounting rules.

In their representations, three companies argued that they had limited scope to manage any impact of this change because their accounting policies are set at group level. We set price limits for companies on a stand-alone basis and we do not take into account the wider group position. We do not agree that it is appropriate that customers should bear additional costs that arise because of accounting policies set by the wider group.

Wider reform of corporation tax

A number of companies have highlighted the impact of any wider reform of corporation tax as an issue in their plans and representations. They have particular concerns about the impact on the sector of the abolition of capital allowances. We have considered this issue and it is not clear to us whether any changes are likely or how they might take effect within this price review period. Furthermore, such changes affect all sectors. We consider this is part of normal business risk and we have not made any allowance for this in our final price limits or included it as a notified item.

5.8 Financial projections underpinning final determinations

We have a duty to enable efficient and well managed companies to finance the proper carrying out of their functions. We have considered carefully the impact that the projected profile of prices will have on the returns, profits and cash flows achieved by the companies.

Table 50 sets out a summary projected profit and loss account for the industry. It also compares the expected position for 2009-10 with the position we assumed when we set price limits in 2004.

The operating profit projection in 2010-11 reflects the change in the level of return. The relatively high level of return in 2009-10 reflects the revenue allowed for financeability at the last price review, as well as the higher cost of capital set in 2004. Thereafter, the operating profit projections remain broadly flat. This is because the additional income the industry needs to finance its growing capital base is offset by other adjustments to revenue. These include adjustments from the CIS mechanism and to recover financing costs for shortfalls.

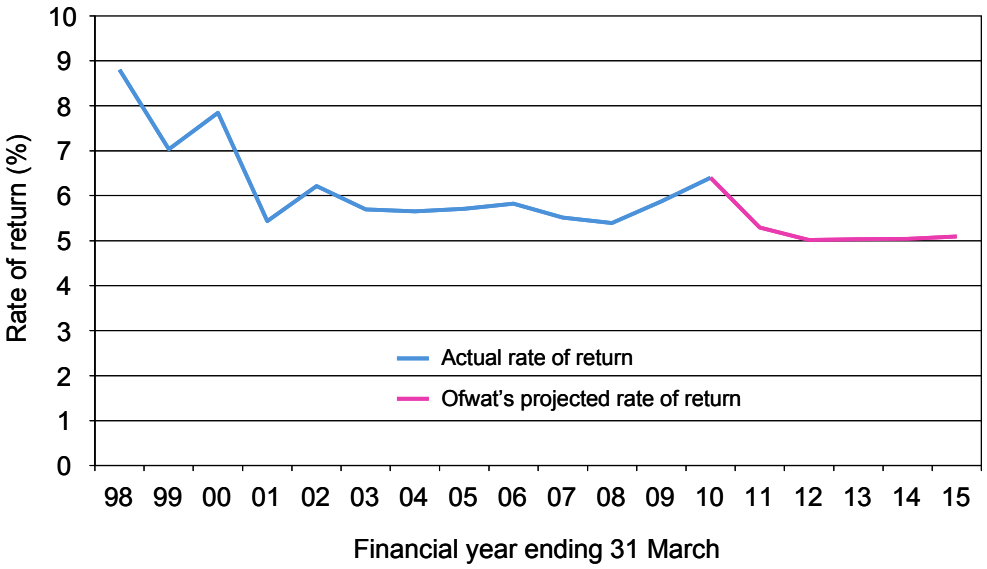
Table 50 Financial projections 2009-10 to 2014-15

Current cost profit and loss account (£ billion)	2009-10		2010-11	2014-15
	2004 review	Actual expected		
Turnover	9.792	9.895	9.502	9.677
Operating expenditure	3.471	3.495	3.699	3.683
Current cost depreciation:	2.110	2.163	2.150	2.275
Infrastructure renewals charge	0.669	0.750	0.810	0.820
Current cost operating profit	3.542	3.507	2.861	2.928
Regulatory capital value (year average)	46.985	47.053	47.731	52.424
Return on capital (post-tax)	5.7%	5.8%	4.5%	4.5%

5.9 Return on capital

Figure 15 sets out the trend in the return on capital from privatisation to 2014-15.

Figure 15 Post-tax rates of return (vanilla basis) 1997-98 to 2014-15



The price limits in 1999 incorporated an immediate step change in returns down to the cost of capital set at that time. After the 2004 price review we expected returns over the period 2005-10 to rise steadily from 5.8% to 6.4% (on a 'vanilla' basis) largely because of higher price limits in 2008-10 to allow for 'financeability'. Actual returns have generally lagged slightly behind our expectation because of lower than expected revenues and higher infrastructure renewals charges. However, for the early part of 2005-10 the costs of finance, particularly the costs of debt, were much lower than we assumed. Despite lower apparent profits, companies have benefited from lower costs of finance and hence higher rates of return to equity. For the period 2010-15, returns are lower than those over 2005-10 reflecting the change in the cost of capital.

5.10 Notified index

We intended to adopt the infrastructure output price index (IOPI) as the index of national construction costs at this price review. IOPI is one of the six composite sub-indices that make up the construction output price index (COPI). New evidence about IOPI has shown that it is not reflective of capital price inflation in the water sector. Consequently, we have decided to retain COPI as the reference index for assessing capital price inflation beyond 2010.

5.11 Inflation

The weak economic environment has made the outlook for inflation (as measured by RPI) uncertain. The RPI index has declined in recent months that is a deflationary position. This makes our projections of RPI more critical than usual.

Our view on inflation follows the trend projections of HM Treasury and most independent forecasters. The trend sees negative inflation in 2009-10 followed by a return to a positive and increasing rate of inflation. We do not see a return to the long-term trend until the latter part of the period. Water and sewerage bills are set in relation to the November RPI. We estimate that this will be negative for November 2009, which sets inflation for 2010-11 bills. The values adopted in our modelling are set out in table 44.

Table 51 RPI inflation

	Financial year average	Year end (March)	Basket year (prior November)
2008-09 (actual)	2.97%	-0.4%	4.28%
2009-10	-0.8%	0.5%	3.00% (actual)
2010-11	2.0%	3.0%	-1.0%
2011-12	3.0%	3.0%	2.0%
2012-13	2.7%	2.7%	3.0%
2013-14	2.5%	2.5%	2.7%
2014-15	2.5%	2.5%	2.5%

On the basis of the published ‘all new construction output price index’ (COPI) values and our view of RPI inflation, the relative capital cost inflation adopted in our financial modelling is:

- 0% for 2009-10;
- turning positive at 0.5% in 2010-11;
- peaking at 1.5% above RPI in 2011-12; before
- returning to long-term trend of 0.5% above RPI in 2013-14.

6. Revenue

We have checked that companies' revenue forecasts are internally consistent and error-free, and that they reflect both recent historical experience and the best available information about the impact on water demand of prospects for the economy. A number of companies included revised demand forecasts in their representations. We have taken account of this new information where companies have both clearly demonstrated why revisions are necessary and explained the corresponding impact on expenditure forecasts.

We consider that companies' forecasts are broadly reasonable, so the adjustments that we have made are modest. At an industry level, our adjustments amount to less than 0.1% of turnover. We have set out our assumptions in table 52 below.

Table 52 Industry base revenues

	Water service (£m)		Sewerage service (£m)	
	2009-10	Annual % change to 2014-15	2009-10	Annual % change to 2014-15
Household revenues	3,343	0.16	3,620	0.10
Non-household revenues	910	-1.38	940	-0.75
Total tariff basket revenues	4,253	-0.16	4,560	-0.07
Non-tariff basket revenues	360	-1.31	234	-1.80
Total revenues	**4,612**	-0.25	**4,794**	-0.15

Using the revenue correction mechanism that we described in our methodology paper, we will make an adjustment at the next price review to take account of each company's revenue outperformance or underperformance relative to the assumptions we will make in our final determinations for 2010-11 to 2014-15. We have confirmed the details of our revenue correction mechanism in PR09/31, 'Revenue correction mechanism' (July 2009).

Appendix 1: Representations on draft determinations

We received written representations from the following (in addition to all the regulated companies and their reporters).

Customers

- CCWater.
- CADIA.
- Paul Cairney.
- Ursula Cowell.
- E A Guinan.
- Richard Osborne.
- Eric Payne.
- Roland C Rench.
- Sandra Woodman.
- 450 residents of Alcester, Worcs.

Company-related bodies

- Councillor Philip Booth (on behalf of the Wessex Water Joint Customer Liaison Panel.
- Stacey Roe (on behalf of Hartlepool Water's Expert Opinion Panel).
- Anglian Water's independent advisory panels.
- The trustees of United Utilities pension fund.
- Water UK.

Industry suppliers and trade bodies

- Hydroco Ltd.
- Society of British Water and Waste water industries (SBWWI).

Unions

- Unison.

Investors

- AXA Investment Managers UK Limited.

- Canada Life.
- Fidelity International.
- Henderson Global Investors Limited.
- HSBC Plc.
- Invesco Perpetual.
- M&G Limited.
- Newton Investment Management Limited.
- RBS Plc.
- TIP (Guernsey) GP Limited.

NGOs

- Action for the River Kennet.
- Blueprint for Water.
- RSPB.
- Waterwise.
- WWF.

Local Government

- Greater London Authority.
- Hartlepool Borough Council.
- Local Government Association (LGA).
- London Borough of Hammersmith and Fulham.
- Mayor of London.
- Partnership for Urban South Hampshire.

Regulators

- Drinking Water Inspectorate.
- Environment Agency.
- Natural England.
- Environment Agency Floods Committee.

Elected representatives

- Hugh Bayley MP.
- Rt Hon David Cameron MP.
- Councillor Merrick Cockell.
- Sir Patrick Cormack MP.
- Councillor Mike Gittus.

- Philip Hammond MP.
- Greg Hands MP.
- Rt Hon Keith Hill MP.
- John Maples MP.
- Rt Hon Sir Malcolm Rifkind MP.
- Graham Stuart MP.

Appendix 2: Using the CIS matrix

The CIS matrix (figure 16) sets out the relationship between the:

- CIS ratio;
- baseline expenditure; and
- capital expenditure included in price limits.

For companies with a ratio above 100, the capital expenditure included in price limits is the baseline expenditure for that company plus 25% of the difference between our view (the CIS baseline) and the companies' final business plan proposals. For companies with a CIS ratio below 100, the capital expenditure include in price limits is the baseline expenditure less 25% of the difference.

The incentive matrix, in combination with the CIS ratio, determines the capital expenditure incentives package on offer to each company. These incentives are unchanged from those we published in December 2008.

Figure 16 CIS matrix

CIS ratio (company: baseline)	**80**	**85**	**90**	**95**	**100**	**105**	**110**	**115**	**120**	**130**
Efficiency Incentive	45.00%	41.25%	37.50%	33.75%	30.00%	27.50%	25.00%	22.50%	20.00%	15.00%
Allowed Expenditure	95.00	96.25	97.50	98.75	100.00	101.25	102.50	103.75	105.00	107.5
Additional Income	1.00	0.89	0.69	0.39	0.00	-0.41	-0.88	-1.41	-2.00	-3.38
Actual Expenditure										
70	12.25	11.72	11.00	10.09	9.00	8.19	7.25	6.19	5.00	2.25
80	7.75	7.59	7.25	6.72	6.00	5.44	4.75	3.94	3.00	0.75
85	5.50	5.53	5.38	5.03	4.50	4.06	3.50	2.81	2.00	0.00
90	3.25	3.47	3.50	3.34	3.00	2.69	2.25	1.69	1.00	-0.75
95	1.00	1.41	1.63	1.66	1.50	1.31	1.00	0.56	0.00	-1.50
100	-1.25	-0.66	-0.25	-0.03	-0.00	-0.06	-0.25	-0.56	-1.00	-2.25
105	-3.50	-2.72	-2.13	-1.72	-1.50	-1.44	-1.50	-1.69	-2.00	-3.00
110	-5.75	-4.78	-4.00	-3.41	-3.00	-2.81	-2.75	-2.81	-3.00	-3.75
115	-8.00	-6.84	-5.88	-5.09	-4.50	-4.19	-4.00	-3.94	-4.00	-4.50
120	-10.25	-8.91	-7.75	-6.78	-6.00	-5.56	-5.25	-5.06	-5.00	-5.25
130	-14.75	-13.03	-11.50	-10.16	-9.00	-8.31	-7.75	-7.31	-7.00	-6.75
140	-19.25	-17.16	-15.25	-13.53	-12.00	-11.06	-10.25	-9.56	-9.00	-8.25

Notes:
All figures, except the 'efficiency incentive' line represent percentages of the baseline expenditure amount. The 'efficiency incentive' is the proportion of outperformance against the 'allowed expenditure' that a company will retain. The figures in the lower part of the matrix show the final rewards (positive figures) or penalties (negative figures) for combinations of CIS ratios and actual expenditure. The matrix is continuously calculated using the following functions, and could be applied beyond the range shown here. It is shown as finite options for CIS ratios within the 80 to 130 range to simplify presentation.

For F >100 (where F is the CIS ratio [company: baseline])
Efficiency incentive rate = 0.8 – 0.005F
Allowed expenditure = 75 + 0.25F
Additional income = -5 + 0.175F – 0.00125F2
For F<= 100 (where F is the CIS ratio [company: baseline])
Efficiency incentive rate = 1.05 – 0.0075F
Allowed expenditure = 75 + 0.25F
Additional income = -10 + 0.2875F – 0.001875F2

Under CIS, companies with lower ratios retain a higher proportion of their outperformance against allowed capital expenditure, and gain higher rewards through additional income. All companies have incentives to achieve outperformance because they can earn higher returns by finding more efficient ways to deliver required outputs.

When we published our draft CIS baselines in December, we noted that the incentives included may not be appropriate or effective if companies continued to exhibit very high ratios. For final determinations, three companies have CIS ratios greater than 130. We have decided to treat these companies as if they had a CIS ratio of 130, while moderating the 'additional income' element of the CIS package (at a flat rate of 0.05% of the baseline for each extra point on the CIS ratio above 130). The adjustment places these companies at a moderate financial disadvantage compared with those companies that achieved CIS ratios of 130 or below.

Approach for companies above130

In December 2008, we published the CIS matrix. We also recognised that CIS style incentives might not be appropriate if companies have very high CIS ratios. In view of this, in December we stated:

> 'At this draft baseline stage the CIS ratios for some companies are very high. Companies have the opportunity to improve this in their final business plans. If they continue to show high CIS ratios, we would need to consider whether CIS-style incentives are appropriate for the affected companies.'

One property of the incentive compatible CIS matrix is that efficiency incentives (that is. to achieve outperformance or to avoid capital overspends) become progressively lower for higher CIS ratios. Above a threshold of 130 (that is, an exposure of 15%) we believe that efficiency incentives are inappropriately low.

For our final determinations, we have therefore applied an 'upper limit' to the operation of CIS at a ratio of 130.

We placed the upper limit at 130 because this retains an efficiency incentive of 15%, providing an appropriate level of discipline on capital expenditure. Any company with a worse ratio than 130 is treated as if it had achieved a CIS ratio of 130, less a further (disadvantageous) adjustment to the additional income line. The adjustment to the

additional income item is a further 0.05% (of the baseline) for each extra point on CIS ratio beyond the upper limit of 130.

This approach retains an appropriate level of efficiency incentive for under or outperformance. It also places these companies in a less advantageous position than those within the 'normal CIS', reflecting our judgement that their capital expenditure plans have been substantially over-estimated.

Illustration

To illustrate this, the determination for a company with a CIS ratio of 150 includes:

- an efficiency incentive equal to that for a company with a CIS ratio of 130 (that is, 15% exposure to under or out performance of allowed capital expenditure);
- allowed capital expenditure at 107.5% (as a proportion of the Ofwat baseline) equal to that for a company with a CIS ratio of 130; and
- additional income equal to that for a company with a CIS ratio of 130 (3.38% of baseline) less the further small negative additional income adjustment (-0.05% of baseline for each extra point on CIS ratio beyond the upper limit, making a further minus 1% of baseline, or -4.38% in this case).

This approach retains efficiency incentives of sufficient strength, but continues to differentiate between companies on the basis of their CIS ratios.

It is not mathematically possible to maintain the pure 'incentive compatibility' of the CIS matrix, while also retaining sufficiently strong efficiency incentives beyond the upper limit. Our approach therefore prioritises efficiency incentives over the pure CIS structure of incentives for companies beyond the upper limit.

Appendix 3: Aggregate five-year financial information for each company

	Operating costs[1]	Infrastructure renewals charge	Current cost depreciation	Return on capital	Taxation	**Total revenue requirement**	OPA and revenue adjustments[2]	Total revenue after OPA and other adjustments
Water and sewerage companies								
Anglian	1,968	345	1,107	1,413	77	**4,910**	16	4,926
Dŵr Cymru	1,220	299	628	927	6	**3,081**	2	3,083
Northumbrian	1,242	217	712	790	216	**3,177**	-26	3,150
Severn Trent	2,486	586	1,402	1,585	231	**6,290**	-6	6,284
South West	720	138	496	618	110	**2,082**	2	2,084
Southern	1,089	255	1,109	898	49	**3,399**	7	3,406
Thames	3,175	643	1,812	2,202	50	**7,882**	-72	7,810
United Utilities	2,463	654	1,800	1,949	348	**7,215**	-113	7,102
Wessex	727	179	469	580	102	**2,058**	28	2,086
Yorkshire	1,566	258	904	1,178	153	**4,060**	19	4,079
Water and sewerage total	**16,655**	**3,576**	**10,440**	**12,139**	**1,343**	**44,153**	**-144**	**44,009**
Water only companies								
Bournemouth & W Hampshire	87	12	41	35	9	**183**	0	184
Bristol	227	70	87	86	11	**482**	-8	474
Cambridge	57	7	13	17	2	**96**	0	96
Dee Valley	53	9	20	16	2	**100**	0	100
Portsmouth	94	22	21	27	4	**168**	1	169
South East	399	109	157	224	13	**902**	-12	890
South Staffs	212	46	73	58	7	**396**	4	400
Sutton & E Surrey	132	31	46	47	5	**261**	-3	258
Veolia Water	519	188	184	184	35	**1,110**	-15	1,095

Central								
Veolia Water East	33	7	10	16	4	**69**	0	69
Veolia Water Southeast	42	10	17	18	2	**89**	0	89
Water only total	**1,855**	**511**	**668**	**727**	**95**	**3,856**	**-33**	**3,822**
Industry total	**18,510**	**4,087**	**11,109**	**12,866**	**1,438**	**48,009**	**-178**	**47,831**

Notes:

1. Operating costs in this table are £41 million higher than shown in tables 26 and 37 as this table includes the equity issuance transaction costs for the equity injections described in section 5.6.2.
2. Revenue adjustments include the adjustment from the CIS mechanism, recovering the financing costs for shortfalls, applying the enhanced incentive allowance for capital outperformance and the operating expenditure outperformance.

Appendix 4: Regulatory capital value – movement between 2010-11 and 2014-15

(£million)
(2007-08 financial year end prices)

Anglian

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	5,218				
2. Opening adjustments	89				
3. Regulatory capital value at 1 April	5,307	5,354	5,519	5,674	5,789
4. New investment	347	467	456	415	378
5. Capital maintenance charges	-295	-296	-296	-295	-295
6. Adjustment for roll-out of past capital efficiency	-5	-5	-5	-5	-5
7. Regulatory capital value at 31 March	5,354	5,519	5,674	5,789	5,868

Dŵr Cymru

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	3,607				
2. Opening adjustments	-15				
3. Regulatory capital value at 1 April	3,592	3,631	3,673	3,707	3,720
4. New investment	235	239	230	211	185
5. Capital maintenance charges	-187	-189	-189	-189	-189
6. Adjustment for roll-out of past capital efficiency	-8	-8	-8	-8	-8
7. Regulatory capital value at 31 March	3,631	3,673	3,707	3,720	3,708

Northumbrian

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	3,013				
2. Opening adjustments	-39				
3. Regulatory capital value at 1 April	2,974	3,027	3,127	3,196	3,233
4. New investment	242	289	260	230	192
5. Capital maintenance charges	-187	-187	-189	-190	-192
6. Adjustment for roll-out of past capital efficiency	-2	-2	-2	-2	-2
7. Regulatory capital value at 31 March	3,027	3,127	3,196	3,233	3,230

United Utilities

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	7,387				
2. Opening adjustments	-10				
3. Regulatory capital value at 1 April	7,376	7,462	7,684	7,987	8,248
4. New investment	607	719	812	783	553
5. Capital maintenance charges	-505	-480	-493	-505	-513
6. Adjustment for roll-out of past capital efficiency	-16	-16	-16	-16	-16
7. Regulatory capital value at 31 March	7,462	7,684	7,987	8,248	8,272

Severn Trent

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	6,239				
2. Opening adjustments	-71				
3. Regulatory capital value at 1 April	6,168	6,216	6,244	6,280	6,341
4. New investment	495	480	489	503	477
5. Capital maintenance charges	-406	-411	-411	-402	-392
6. Adjustment for roll-out of past capital efficiency	-41	-41	-41	-41	-41
7. Regulatory capital value at 31 March	6,216	6,244	6,280	6,341	6,385

South West

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	2,519				
2. Opening adjustments	-63				
3. Regulatory capital value at 1 April	2,456	2,466	2,490	2,487	2,463
4. New investment	143	162	141	122	100
5. Capital maintenance charges	-120	-126	-131	-133	-135
6. Adjustment for roll-out of past capital efficiency	-13	-13	-13	-13	-13
7. Regulatory capital value at 31 March	2,466	2,490	2,487	2,463	2,416

Southern

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	3,428				
2. Opening adjustments	-95				
3. Regulatory capital value at 1 April	3,333	3,415	3,562	3,647	3,646
4. New investment	355	434	379	297	280
5. Capital maintenance charges	-261	-274	-281	-285	-286
6. Adjustment for roll-out of past capital efficiency	-13	-13	-13	-13	-13
7. Regulatory capital value at 31 March	3,415	3,562	3,647	3,646	3,627

Thames

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	7,420				
2. Opening adjustments	176				
3. Regulatory capital value at 1 April	7,595	8,072	8,812	9,293	9,631
4. New investment	988	1,274	1,030	897	704
5. Capital maintenance charges	-468	-490	-506	-516	-517
6. Adjustment for roll-out of past capital efficiency	-43	-43	-43	-43	-43
7. Regulatory capital value at 31 March	8,072	8,812	9,293	9,631	9,774

Wessex

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	2,150				
2. Opening adjustments	24				
3. Regulatory capital value at 1 April	2,174	2,186	2,240	2,331	2,403
4. New investment	157	200	241	223	193
5. Capital maintenance charges	-128	-129	-133	-134	-136
6. Adjustment for roll-out of past capital efficiency	-17	-17	-17	-17	-17
7. Regulatory capital value at 31 March	2,186	2,240	2,331	2,403	2,442

Yorkshire

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	4,379				
2. Opening adjustments	24				
3. Regulatory capital value at 1 April	4,403	4,492	4,650	4,803	4,883
4. New investment	345	418	423	361	277
5. Capital maintenance charges	-222	-225	-236	-246	-253
6. Adjustment for roll-out of past capital efficiency	-34	-34	-34	-34	-34
7. Regulatory capital value at 31 March	4,492	4,650	4,803	4,883	4,873

Bournemouth & West Hampshire

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	131.5				
2. Opening adjustments	2.5				
3. Regulatory capital value at 1 April	134.0	130.8	127.1	125.4	123.9
4. New investment	8.2	8.0	9.6	9.9	8.5
5. Capital maintenance charges	-10.7	-10.9	-10.6	-10.7	-11.0
6. Adjustment for roll-out of past capital efficiency	-0.8	-0.8	-0.8	-0.8	-0.8
7. Regulatory capital value at 31 March	130.8	127.1	125.4	123.9	120.7

Bristol

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	261.2				
2. Opening adjustments	7.6				
3. Regulatory capital value at 1 April	268.8	283.2	313.8	334.4	344.9
4. New investment	45.4	62.8	53.9	44.2	37.0
5. Capital maintenance charges	-30.2	-31.3	-32.6	-32.9	-32.7
6. Adjustment for roll-out of past capital efficiency	-0.8	-0.8	-0.8	-0.8	-0.8
7. Regulatory capital value at 31 March	283.2	313.8	334.4	344.9	348.4

Cambridge

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	55.0				
2. Opening adjustments	-1.6				
3. Regulatory capital value at 1 April	53.4	59.0	60.9	61.6	62.3
4. New investment	9.5	6.0	5.0	5.2	4.5
5. Capital maintenance charges	-3.8	-4.0	-4.2	-4.4	-4.4
6. Adjustment for roll-out of past capital efficiency	-0.1	-0.1	-0.1	-0.1	-0.1
7. Regulatory capital value at 31 March	59.0	60.9	61.6	62.3	62.3

Dee Valley

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	54.8				
2. Opening adjustments	1.2				
3. Regulatory capital value at 1 April	56.0	55.8	59.3	62.7	61.3
4. New investment	5.4	9.4	9.6	5.1	4.6
5. Capital maintenance charges	-5.3	-5.6	-5.9	-6.2	-6.3
6. Adjustment for roll-out of past capital efficiency	-0.3	-0.3	-0.3	-0.3	-0.3
7. Regulatory capital value at 31 March	55.8	59.3	62.7	61.3	59.3

Portsmouth

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	105.1				
2. Opening adjustments	2.0				
3. Regulatory capital value at 1 April	107.1	105.2	102.0	102.4	98.2
4. New investment	8.4	7.2	10.9	6.2	6.1
5. Capital maintenance charges	-8.7	-8.7	-8.9	-8.8	-8.6
6. Adjustment for roll-out of past capital efficiency	-1.6	-1.6	-1.6	-1.6	-1.6
7. Regulatory capital value at 31 March	105.2	102.0	102.4	98.2	94.0

South East

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	801.3				
2. Opening adjustments	8.8				
3. Regulatory capital value at 1 April	810.1	838.4	861.4	886.4	906.4
4. New investment	81.7	78.5	80.0	73.5	75.5
5. Capital maintenance charges	-53.1	-55.2	-54.7	-53.2	-54.3
6. Adjustment for roll-out of past capital efficiency	-0.3	-0.3	-0.3	-0.3	-0.3
7. Regulatory capital value at 31 March	838.4	861.4	886.4	906.4	927.4

South Staffs

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	205.4				
2. Opening adjustments	5.4				
3. Regulatory capital value at 1 April	210.8	217.5	222.4	224.6	222.8
4. New investment	29.9	29.2	28.1	24.1	23.4
5. Capital maintenance charges	-22.3	-23.4	-24.9	-25.0	-24.8
6. Adjustment for roll-out of past capital efficiency	-0.9	-0.9	-0.9	-0.9	-0.9
7. Regulatory capital value at 31 March	217.5	222.4	224.6	222.8	220.4

Sutton & East Surrey

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	159.4				
2. Opening adjustments	2.6				
3. Regulatory capital value at 1 April	162.0	170.1	176.8	181.1	182.0
4. New investment	23.8	23.0	21.0	17.9	16.2
5. Capital maintenance charges	-14.8	-15.4	-15.8	-16.1	-16.0
6. Adjustment for roll-out of past capital efficiency	-0.9	-0.9	-0.9	-0.9	-0.9
7. Regulatory capital value at 31 March	170.1	176.8	181.1	182.0	181.3

Veolia Central

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	764.2				
2. Opening adjustments	-26.7				
3. Regulatory capital value at 1 April	737.5	722.2	709.2	702.5	701.4
4. New investment	67.3	70.1	77.2	81.3	69.2
5. Capital maintenance charges	-75.6	-76.1	-77.0	-75.3	-74.3
6. Adjustment for roll-out of past capital efficiency	-7.0	-7.0	-7.0	-7.0	-7.0
7. Regulatory capital value at 31 March	722.2	709.2	702.5	701.4	689.3

Veolia East

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	58.3				
2. Opening adjustments	0.1				
3. Regulatory capital value at 1 April	58.4	57.3	58.0	56.5	55.0
4. New investment	2.5	4.4	2.3	2.3	2.3
5. Capital maintenance charges	-3.2	-3.4	-3.4	-3.5	-3.5
6. Adjustment for roll-out of past capital efficiency	-0.4	-0.4	-0.4	-0.4	-0.4
7. Regulatory capital value at 31 March	57.3	58.0	56.5	55.0	53.4

Veolia Southeast

	2010-11	2011-12	2012-13	2013-14	2014-15
1. Closing regulatory capital value as at 31 March 2010	64.6				
2. Opening adjustments	0.1				
3. Regulatory capital value at 1 April	64.7	65.1	69.0	73.8	73.9
4. New investment	5.5	9.4	10.4	5.8	3.3
5. Capital maintenance charges	-5.0	-5.4	-5.5	-5.6	-5.4
6. Adjustment for roll-out of past capital efficiency	-0.1	-0.1	-0.1	-0.1	-0.1
7. Regulatory capital value at 31 March	65.1	69.0	73.8	73.9	71.7

Appendix 5: Capital efficiency and outperfomance under the CIS

Section 4.2 set out the key features of the CIS including the additional income, the symmetrical approach to the RCV and capital efficiency. In considering the CIS mechanism, companies and other commentators have focused on the additional income factor and assumed the companies will not outperform our final determinations capital expenditure assumptions.

However, the approach to capital efficiency is equally important. A comparison with our approach at previous price reviews will serve to highlight the greater scope for capital expenditure outperformance under CIS. It is important to be aware of these.

- We have used ‘central’ rather than ‘frontier’ efficiency benchmarks in setting capital expenditure assumptions. This means that the efficiency challenge built into our capital expenditure baseline is less tough than at previous price reviews.

- Capital expenditure assumptions in our determinations also reflect a mix of both our view and the company business plan (as set out in the CIS matrix). For companies with CIS ratios greater than 100, this also means that capital expenditure allowed within the determination is higher than under previous price reviews.

- The output expectations for the capital programme are aligned with our baseline assumptions. Companies will only be expected to deliver the output scope assumed by us, not the full range of outputs proposed in their plan (if these were greater in scope and have been subject to a challenge in the determination).

The purpose of the illustration is to show that by outperforming our final determinations capital expenditure, companies are able to achieve a return on equity above that in our assumptions. The extent of this incremental return depends upon the ex ante CIS ratio and the outturn performance; a company with low ex ante CIS ratios and low outturn capital expenditure will achieve the greatest level of outperformance.

Illustration

In this section, we calculate by means of an illustration the returns on equity under a CIS approach and under the frontier efficiency approach adopted at the 2004 price review. The illustration is based on industry data for the final determinations and the cost of equity (7.1%) we have assumed in our final determinations.

In drawing comparisons with our 2004 approach, we have assumed the same level of scope challenge to the final business plans. Our approach at this price review to challenging scope is similar to that used in 2004. Therefore, the difference between the 2009 and 2004 capital expenditure allowed for ex ante in price limits is because of efficiency assumptions.

The base assumptions set out in table 53 reflect the industry position in our final determinations. Under a frontier approach in 2004, we calculate the efficiency assumed in price limits would be about £1.8 billion, compared with £0.4 billion at this review under CIS. The net capital expenditure at this review (after assumed efficiency) is £21.8 billion. The comparable figure using the frontier approach is £20.4 billion (that is, £1.4 billion less). Capital expenditure has been assumed to be profiled evenly over the period 2010-15. Gearing is assumed to be constant at 57.5% and no out-performance is assumed against other cost assumptions.

Table 53 Base assumptions

Base assumptions	£ billion	CIS ratio
Opening RCV	48.0	
Proportion of capex RCV remunerated	80%	
Depreciation assumption (years)	21	
CIS approach in 2009		
Final business plan capex	22.5	104.4
FD CIS baseline	21.5	100.0
Capex included in price limits	21.8	101.1
Frontier approach in 2004		
Equivalent total capex	20.4	
Outturn	19.8	92.0

Tables 54 and 55 compare the return on equity following both the CIS approach and the frontier approach assuming outturn at £19.8 billion. This would be equivalent to an outturn performance at 92% of the 2009 baseline figure. This level of outperformance is relatively conservative, since it is lower than that required to meet the 2004 review style efficiency take assumptions. It is therefore equivalent to outperformance of just over 2% against a determination with a 2004 review style efficiency challenge. (In past review periods, including 2005-10, most companies and the industry aggregate shows some outperformance on capital expenditure. We expect industry outperformance to be around 3.5% for 2005-10).

Table 54 2009 CIS approach

Year		0	1	2	3	4	5
RCV	£ billion	48.0	49.2	50.4	51.4	52.5	53.5
Ex-ante return on equity	%		7.03	7.03	7.03	7.03	7.03
Within period return on equity	%		7.48	7.55	7.61	7.68	7.74
Shadow RCV	£ billion	48.0	48.9	49.8	50.5	51.3	52.0
Ex-post equivalent return on equity	%		7.62	7.65	7.69	7.73	7.77

Table 55 2004 frontier approach

Year		0	1	2	3	4	5
RCV	£ billion	48.0	49.0	49.9	50.8	51.6	52.4
Ex-ante return on equity	%		7.10	7.10	7.10	7.10	7.10
Within period return on equity	%		7.23	7.25	7.27	7.29	7.30
Shadow RCV	£ billion	48.0	48.9	49.8	50.5	51.3	52.0
Ex-post equivalent return on equity	%		7.35	7.38	7.41	7.43	7.46

Ex-ante RCV

The ex-ante RCV is higher under CIS than it would have been under the 2004 frontier approach. This is because:

a) it will include 25% of the difference in capital expenditure between the CIS baseline and the final business plan; and
b) the baseline includes a central view, rather than a frontier approach, to efficiency. Under the frontier approach an inefficient company must achieve at least the continuing and frontier shift efficiencies in order to earn the price determination cost of equity.

Ex-ante return on equity

The CIS additional income can have a positive or negative impact on the ex ante equity return. At PR09, CIS ratios that exceed 100 lead to a reduction in ex ante equity returns (table 53). The ex-ante return on equity is always the cost of equity under the PR04 approach (table 54).

Shadow RCV and subsequent calculations of equity returns

Under the CIS mechanism, the RCV will be 'trued up' at the next price review to reflect actual capital expenditure. We present a within period return on equity which assumes all outperformance from capital efficiency accrues to equity. This equity return is calculated on the equity investment that is consistent with the shadow RCV. The shadow RCV represents actual capital expenditure spend based on the assumed actual level of investment.

The final CIS incentive will be calculated in NPV terms according to the incentive payment determined by the CIS matrix (see appendix 2). For the purposes of this example, the ex-post equivalent return on equity includes the effect of the ex-post true up calculations.

Under the 2004 approach, companies retain the benefit of capital outperformance for five years before they are unwound from the RCV. To allow comparison of equity returns, in table 55, we assume capital expenditure outperformance is unwound within the five-year period and the total outperformance incentive calculated in the year in which the efficiency was achieved. The equity returns are then calculated on a comparable basis to the efficiency under the CIS approach.

As can be seen, capital efficiency under both approaches leads to higher equity returns, but the 2009 approach with CIS earns more – about 29 basis points a year on average.

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