C1 CONSUMERS' VIEWS

Contents

1 OVERVIEW

We have used a number of sources of information along with formal consultation to understand what our consumers want and are prepared to pay for in the period 2010-2015 and beyond.

We have set out in this section how we have identified consumers' priorities and how our strategy reflects consumers' preferences. We include the evidence we have used to ascertain consumers' views and how it has been used to inform our proposals. It has been updated since our draft plan submission in 2008 August and includes:

- The Company's research
- Industry research, including that taken out following publication of the draft business plans in August 2008
- Work carried out at PR04
- Evidence of stakeholder views
- DEFRA's Water Strategy
- Operational Consultation
- Consumer Council for Water (CCW)
- Water resource Management Plan
- Consumer views and cost benefit analysis

In addition to consulting our consumers, we have also involved the Environment Agency, Drinking Water Inspectorate, Natural England and CCW.

Customer research is a key tool for measuring customer perceptions of how well the company delivers and helping us to gain a clear understanding of customer priorities.

As well as informing us of consumer priorities the feedback from this consultation has already been fed back into the business to improve performance. Our improvement over the past twelve months in customer satisfaction is a direct result of initiatives taken following customer and stakeholder feedback.

We have taken specific account of the joint industry research, '*Understanding customers' views – PR09 Quantitative Research into Customers' Priorities*', which was carried out following publication of the draft business plans in August 2008.

The business deals with consumer and stakeholder feedback on an ongoing basis. Our small size allows any issues to be readily transparent at senior management level. Trends in performance levels or perception are continually monitored. The principle forum at Tendring Hundred Water for such operational review is the Executive Management Committee which meets formally on a monthly basis. Much of the feedback will be dealt with directly by the Head of Customer Services and the Customer Services team.

The Company has taken account of the downturn in the economic climate since its draft plan was submitted in August 2008 and recognises that a number of customers will be

under increasing financial pressure as a result. In view of this, we have made significant reductions to our costs for the AMP5 period and are satisfied that our proposed strategy reflects the views of customers on the overall balance between service levels and prices.

Investment levels are lower than the AMP4 period during which time customers benefitted from real term reductions in prices. Our investment relates almost exclusively to base service provisions (MNI and IRE), where a failure to invest will increase the likelihood of failure, disruption or a deteriorating service unacceptably. By completing our metering programme we reinforce our strong water efficiency credentials. However, we can take advantage of a planned approach, integrated with our meter and communication pipe replacement programmes, that will see it delivered for a considerable saving.

Our Automatic Metering programme brings significant additional services to customers and importantly pays for itself as a result of the operational efficiencies we can make following its implementation.

2 Evidence of Consumers' Views

2.1 Company's Research

2.1.1 SDS

We presented our outline long term plans to a group of parish councillors in October 2007. We felt that this group was representative of our customers and they were close to the specific needs of a variety of consumer groups. We discussed our plans with attendees and held break out discussion groups to review the key issues and our proposals.

Key feedback from this session is given below along with our proposal for incorporating it into our plans.

	SDS Customer feedback October 2007	Draft Business Plan 2008
1	**Water Quality** Water quality was good and that no further investment was required.	• No quality schemes are included. • Maintenance programmes are established to maintain current levels. • There is likely to be slight improvement. • Catchment Management to be introduced for Ardleigh Reservoir in relation to two pesticides; Clopyralid and Metaldehyde
2	**Water hardness** Hard water was acceptable and THW should not treat the water to make it softer.	• We have no plans to soften water • We recognise there was a willingness to pay for this. • Feedback from customers is consistent; consumers still have a choice as after-market water softeners are available
3	**Water efficiency** THW should do more to make people think about water efficiency.	• We have built a customer education programme into our plans for AMP5.
4	**Green energy** Customers would only support the use of green energy if it represents good value.	• We have not made any additional allowance for green energy in our plans • We plan to purchase it in future if costs match other sources.

	SDS Customer feedback October 2007	Draft Business Plan 2008
5	**Leakage** The leakage level is acceptable as it is	• We will not improve leakage through active leakage control • A slight benefit will arise from our metering programme that will reduce supply pipe losses.
6	**Metering - 1** Support for comprehensive metering and agreement it should be mandatory for new properties.	• We have targeted 90% metering (i.e. universal) by 2015. • Metering is already mandatory for new properties.
7	**Metering - 2** Mixed response was received on compulsory metering. Feedback from the draft water resource plan was generally not supportive.	• We do not plan for charging by meter to be compulsory at this stage
8	**Metering – 3** More incentives required for customers to switch to a meter.	• We will improve communication on metering • We will give dummy bills to customers who have a meter fitted yet are charged on an RV basis in order to encourage them to convert.
9	**Asset maintenance** The company should stick with a strategic maintenance strategy	• We have maintained our strategic maintenance approach and will not reduce investment in order to shift to a reactive approach.
10	**Customer accounts** Improve bills and consider making more information available over the internet	• We will roll out a new bill in June 2009 • We will improve ways for customers to pay bills and review web account management.
11	**Affordability** Customer's financial hardship should generally be addressed by the social security system.	• We will work with social services to improve access for payment of water bills. • We will trial a social tariff in Clacton linked to AMR.

2.1.2 Willingness to Pay

In 2007 we carried out a Willingness to Pay (WTP) survey of our customers. The aim of the project was to assess customer preferences for different levels of service supplied by Tendring Hundred Water through the use of survey-based stated preference methods.

This survey was designed to assess household priorities measured by their reaction to subsequent changes in water bills as a consequence of changes in service levels.

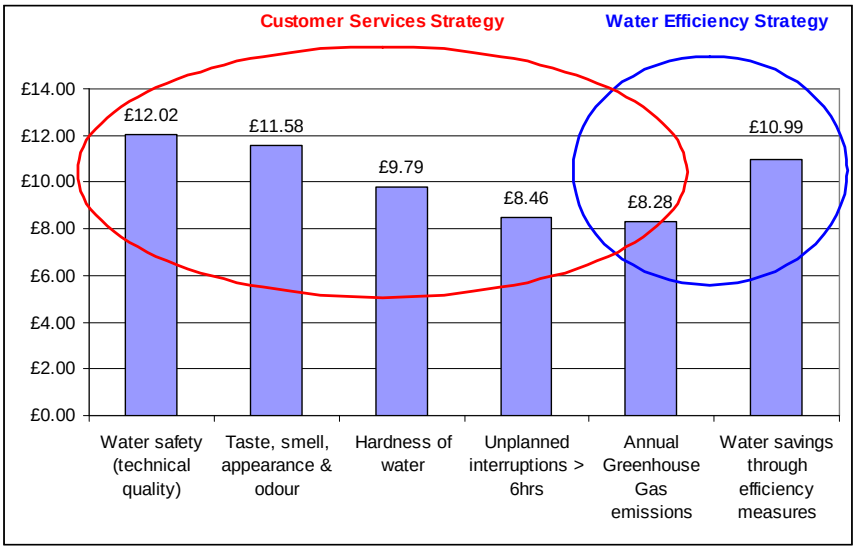
Prior to the survey itself we ran two focus groups in Clacton to gauge customer reaction to our services, and also to test a number of questions that we planned to ask in the WTP survey. These groups allowed us to improve the working of questions and put them in ways which customers would understand.

The focus groups also gave an extremely useful chance for customers to feedback directly to the management team of Tendring Hundred Water. Feedback from the ultimate WTP survey was that customers were willing to pay more for water if it were softened by the Company. At the focus groups the matter was discussed in more detail. Initial responses had been that the water was too hard, however reaction was mixed to softening. The groups concluded independently of Company officers that soft water was a personal choice that could be met through a strong and competitive market and central water softening by Tendring Hundred Water was not required. Many within the group actually preferred the taste of hard to soft water. These views support our decision not to implement a water softening programme in Amp5.

There was wide discussion with company executives on our literature and methods of communication. We got strong feedback that our customer booklet which was issued to all customers annually was not read and invariably thrown in the waste bin. We took this message into consideration when we redesigned our company leaflets in 2008. We have plans in AMP5 to improve our website and communicate more effectively in general.

Ultimately, the modelling results were very encouraging and were used to calculate the WTP for the different attributes. The results are presented below for the maximum service improvement presented in the survey design.

Willingness to pay ; £ per customer



Following the changing economic climate we have amended the values used in the calculation of benefits for customers using the results of our willingness to pay survey.

The CBA scoring mechanism and values were reviewed and updated following revisions to these Willingness-to-Pay values which have now been entered. These are set out in Section C8 under the CBA commentary. In summary, a review was carried out between draft and final business plans to ensure there was still a high degree of confidence that the correct WtP values were being used. The conclusion for THWS was that the value for reducing supply interruptions was too high particularly when compared to values obtained from other companies and we have consequently reduced the benefit scores derived where this OPM had been used.

Our feedback from customers in November 2008 supports the assumption that people are still be willing to pay for some improvements in service, however this recalculation reflects the likelihood that they may not be willing to pay as much as before.

Water safety and taste, smell appearance and odour

We will manage water quality through our drinking water safety plans. Our maintenance work on infrastructure and non-infrastructure will sustain the current low risks of operational failure and consequential impacts on water quality. Our replacement of the reservoir at Dovercourt will improve security of supply and minimise the risk of poor water quality as a result of trunk mains failure.

Hardness of Water

We do not plan to tackle the hardness of water. All consumer groups concluded that this was unnecessary as water softeners were available on the market to anyone who desired soft water. Some consumers preferred the taste of hard water.

Unplanned Interruptions

Our maintenance work on infrastructure and non-infrastructure will sustain the current low risks of operational failure. Our replacement of the reservoir at Dovercourt will minimise the risk unplanned interruption as a result of trunk mains failure.

Water savings through efficiency measures

Our biggest water efficiency measure will be achieved by driving meter penetration to 90% by 2015. We will sustain leakage at current levels, below the economic level. We will enhance our customer education programme and refocus it towards water efficiency and the environment. We will develop water efficiency services around automatic meter reading and employing a water efficiency technician.

Annual greenhouse gas emissions

Our continued focus on water and business efficiencies will reduce greenhouse gas emissions. We will also procure green or nuclear energy when it is cheaper or at the same cost of brown energy.

2.1.3 Annual Survey

We carry out annual surveys to obtain customer views on our current and future services. The results of the 2007 and 2008 surveys are reviewed below. The 2008 survey was delayed to align it with the business planning process and seek views on company proposals ahead of Final Business Plan submission in April 2009.

Customer Tracking Study, 2007 and 2008
The research was conducted in three waves by telephone calling 200 customers in each wave and is intended to provide robust primary data which can be used:

- To give independent feedback on overall customer satisfaction and perception;
- To identify areas where service improvements are called for;
- To understand customer behaviour and
- To determine customer attitudes to topical issues.

Key Findings
Key findings of the **Phase 1 (March 2007)** survey were:

- Customers are very satisfied with overall service;
- Satisfaction with contact handling is high;
- Customers are very satisfied with the quality of drinking water;
- Hardness is by far the main water quality issue for our customers
- Customers with meters tend to use less water;
- Customers consider meters to be a fair way of charging;
- The overall perception of value for money of water is reasonably good;
- Main complaint is that bills keep going up;
- The vast majority of customers consider water conservation important;
- There is a concern about leakage rates;
- A financial incentive is most likely to encourage customers to conserve water;
- Customers need more information about water saving measures from THWS.

Most of this feedback was as expected, however we noted that there was concern amongst our customers that the Company does not do enough to conserve water. As Tendring has the lowest leakage in the country we found this surprising but believe it was a reaction to the general media interest in water and leakage in the South East.

We have committed to enhance our communications in future so that Tendring Hundred customers understand better the efforts made by the company in water conservation and its successful performance to date.

The **Phase 2 survey (October 2007)** gave different feedback insofar as there was a deterioration in overall customer satisfaction. Removing the variances that will come from a small sample size we recognized that the quality of our service was not up to our usual high standards. As a consequence we introduced our quality improvement programme '*Six Strands of Excellence*' which has already gone some way to improving customer satisfaction. We have incorporated the learning from this programme into our

plans for AMP5 as we seek to continually improve the experience for Tendring Hundred Water customers.

Phase 3 survey (November 2008)
This survey was particularly informative as it took place after the draft business plan had been submitted and at a time when the economic downturn had been recognized and was starting to impact on our customers.

Key findings were:

Overall service
- 87% of customers are satisfied or very satisfied with the overall service they receive from Tendring Hundred.
- 85% of customers are satisfied with their drinking water quality
- Just 4% of customers have experienced a problem with their water supply in the last 12 months
- Leaking pipes or burst mains were the most commonly cited reason for having to contact. *This is linked to high consumption queries from metered customers who wish to reduce their bill.*

Metering
- 69% of customers surveyed had a water meter, of which a significant proportion said that they use less water as a result of having a meter (47%)
- Reasons given for not having a meter were (i) customers have simply just not thought about having one, and (ii) believe that having a meter will actually cost them more. *This supports our proposal for comparative billing to allow customers to make an informed decision.*
- 42% of non-metered customers believe that meter charges are a fair way to pay for water usage

Value for money
- 85% of customers give a score of satisfied or very satisfied on whether the service provides value for money
- Customers appeared more supportive of paying more to see an improvement in services (willingness to pay questions). In particular there was significantly more openness to the idea of paying more to see fewer burst pipes. *This supports retention of willingness to pay in our benefit calculations for projects.*
- 85% of customers continue to be in support of reduced charges for low income customers. *This will be possible through our AMR programme proposed in AMP5.*

Water efficiency
- 95% of the sample believe it is important to conserve water
- Water conservation measures taken by customers are high with 75% claiming to take short showers, not baths and 72% brushing their teeth without running a tap
- There has been a significant increase on previous surveys in the proportion of customers who use water efficient devices, such as a hippo in the loo, spray taps, or who own a water butt.

- 68% of customers cited more information as being key to encourage further water conservation. *This supports our proposals to enhance our education programme in AMP5.*

2.2 Joint Stakeholder Research

2.2.1 DG9 Customer Satisfaction

In order to allow a consistent and relative performance comparison between water companies, the Water Services Authority introduced a number of key measures of customer service. One of these measures, DG9, concerns the level of service received by consumers when telephoning the company. A customer satisfaction survey (Quality of Call Handling) is used to establish performance against this measure.

An independent market research organisation carries out this survey on a quarterly basis on behalf of each water company in England and Wales. For each water company taking part, a target of 100 telephone interviews is set for each wave of the survey equating to 400 per Water Company per year.

In respect of Customer Satisfaction, the Company has recently been ranked 1st across the industry in 2008/09 a further improvement on the previous two years when it was 3rd in 2007/08 and (2006/07: 7th).

Some of the questions that the customer was asked were:

Call Handling – customer satisfaction survey results

Question	Year	Company score	Industry average	Rank
Did you get through to the Company on your first attempt, whether to an automated message or a person?	**2008/09**	**96%**	**89%**	**1st**
	2007/08	95%	89%	1st
	2006/07	97%	89%	1st
Overall how satisfied were you with the length of time that you had to wait before your call was answered?	**2008/09**	**4.74**	**4.35**	**1st**
	2007/08	4.6	4.32	3rd
	2006/07	4.5	4.17	1st
Overall how satisfied were you with the manner in which your call was handled?	**2008/09**	**4.82**	**4.59**	**1st**
	2007/08	4.73	4.56	3rd
	2006/07	4.54	4.47	5th
How satisfied were you with the final solution of the call, i.e. the action that was taken as a result of your call?	**2008/09**	**4.66**	**4.36**	**1st**
	2007/08	4.62	4.32	2nd
	2006/07	4.5	4.36	3rd

The improvement we have seen in customer satisfaction was principally a result of our quality improvement programme '*Six Strands of Excellence*' (6SE). This programme itself was designed around feedback from staff as well as from customers or received

direct from the Consumer Council for Water as a result of their own audits. We also used information from previous surveys.

For instance, the key feedback that emerged from the 2007/08 survey was that staff politeness and willingness to help and staff understanding the reason for the call are highly important in driving overall satisfaction. Our training in 2008 has consequently centered around empathy with the customer and seeking of first time resolution.

We aim to maintain the standards we have set ourselves for customer service standards into AMP5, using the learning from 6SE and by ensuring we have processes in place to improve the customer experience and deliver the same high standards against the new OPA measures.

2.2.2 Deliberative Research concerning Consumers' Priorities for PR09

The purpose of this research was to explore consumers' priorities for water and sewerage services for the period 2010-15.

It was undertaken on behalf of eight organisations; Consumer Council for Water (CCWater), Environment Agency, Water UK, Defra, Natural England, Welsh Assembly Government, Drinking Water Inspectorate (DWI) and Ofwat. Corr Willbourn Research were employed to complete the research. CCWater took a lead role in commissioning and managing this research.

The deliberative process

A three stage consumer research programme has been established;

- Stage 1 (complete)
  - Consumer research was carried out by Tendring Hundred Water with input from CCWater, to inform and develop our Strategic Direction Statement published in December 2007.
  - We have also completed Willingness to Pay consumer research for use in weighing up the costs and benefits of different options for inclusion in their draft business plans.

- Stage 2 (complete)
  - Regional and national deliberative consumer research carried out. Each water and sewerage company to take account of this information as they develop draft business plan proposals.

- Stage 3 (complete)
  - Once water and sewerage companies have submitted their draft business plans, a third stage of research will be undertaken. Consultants have been engaged to carry out quantitative consumer research. This will explore consumers' views on the value for money, acceptability and affordability of their

water company's draft business plan proposals. This will get consumers' views on the total package of outputs that each company puts forward and the combined impact on bills.

Key findings from Phase 3

Service

- 92% of customers stated that they were satisfied with the services provided by Tendring Hundred Water
  - The main reason customers were satisfied was that there was a good/reliable service with no interruptions (89%).
  - The main reasons that customers were dissatisfied were that the water was poor/unreliable (36%), prices are always increasing (27%) and that it was too expensive already (27%).

Draft Business Plan

- 65% felt that the plan was acceptable, 28% felt that it was unacceptable, and 8% stated that they did not know.

Informed Views on current service

- The majority of customers, 82%, stated that the current water service was either good value for money or were neutral. Only 18% felt that the service was poor value for money. The key reason that current services were felt to offer poor value for money was that it was too expensive already.

Informed Views on Draft Business Plan (DBP)

- 64% of customers felt that Tendring Hundred Water's DBP and the impacts on their bill for water services was acceptable, the main reasons being that the plan is affordable (68%) and they valued the improvements (23%).
- 30% of customers felt that Tendring Hundred Water's DBP and the impact on their bill for water services was unacceptable, the main reasons being that it was too expensive already (63%) and they opposed paying more to companies who make large profits (11%).

Timing

- 98% of Tendring Hundred Water's customers indicated that their preferred bill option for the period 2010 - 2015, is for bills to change steadily every year throughout the period, so that they do not see big changes from year to year.

Summary

We have taken account of these views within our plan. We have reduced maintenance to a level lower to that expended in AMP4 when bills were reducing in real terms. We have taken out all non-essential items. One enhanced service has been retained, which is an automatic meter reading system for Clacton. This system will provide excellent information for customers and also has the effect of reducing bills as a consequence of the operational efficiencies it allows us too make within the company.

We have modeled tariffs on a phased approach and reviewed these with the Consumer Council for Water (CCW). We are concerned that when tariffs are amortised over the five year period that the customer ends up with a much higher water bill in five years time. We have consequently left bills with a single major increase to match financial requirements for the period.

2.3 Work carried out at PR04

2.3.1 Introduction

The Company did not carry out customer research explicitly for the purposes of preparing its Final Business Planat PR04. This was because the proposals for the AMP4 period incorporated very little in terms of new and enhancement expenditure, and mainly related to maintenance expenditure on above and below ground assets.

The Company did review the results of work carried out at a national level by the joint stakeholders.

2.3.2 Customer Research 2003: Periodic Review – National Report (MVA)

Key results from the survey showed that:

Customer current satisfaction and value for money

83% of the Company's customers sampled stated that they were satisfied with the service provided and 54% rated the service as good value for money.

Importance of maintaining services

When shown the current service levels in their area, 97% of our customers considered it either 'important' or 'very important' that these are maintained and not reduced "Maintaining the quality and safety of drinking water" and "ensuring a reliable and continuous water supply" were given the highest levels of support nationally.

Importance of improving services

When asked the importance of improving service elements, without being told the associated costs, most customers thought it was "important" or "very important" to improve in all areas. However, this was considered slightly less important than maintaining current services.

Company Specific Report

On a Company specific basis, the report concluded that:

"…customers were satisfied with current services (83%) and considered the service good value for money (54%). Customers wanted to see current services at least maintained at existing levels. More customers thought the Company Preferred Plan offered good value for money (50%) than poor (25%). The top three service elements supported by customers were 'ensuring the safety of tap water' (69% -77%), 'managing the appearance, taste and smell of tap water' (63%-70%), 'ensuring a reliable and continuous water supply' (62%-70%)."

2.3.3 The 2004 Periodic Review: Research into Customers' Views (MORI)

In the 2003 Mori survey The 2004 Periodic Review: Research into Customers' Views it was established that there is generally high satisfaction with the tap water supply services (87% very or fairly satisfied). In determining the most influential aspects of overall satisfaction , the top eight drivers for water were identified as the following:

- Taste and smell of tap water;
- Maintaining safety of tap water;
- Appearance of tap water
- Maintaining water infrastructure;
- Pressure of water in the taps;
- Handling customers' queries
- Continuous water supply; and
- Preventing bursts and leaks.

The overall strategy in AMP4 was aimed at maintaining service in all these areas and the AMP5 strategy of a high quality water efficient service will also deliver improving service levels on these items.

2.3.4 Customers' Perceptions and Expectations – Wave 4 (MORI)

AT PR04, the Company referred to its own market research in July 2001. The survey outcomes were very similar to those achieved by the 2004 Periodic Review survey mentioned above. In summary:

- 87% of the Company's customers were found to be satisfied (very or fairly satisfied) with the overall service provided;
- 62% of customers were satisfied with the overall value for money; and
- 75% of customers were satisfied with the quality of drinking water.

When rating the importance of particular aspects of the water service, the following were rated as important (vital, very or fairly important):

- Taste – 86%;
- Smell – 96%;

- Water pressure – 91%;
- Water hardness – 80%;
- Reducing leakage – 75%;
- Time taken to attend to bursts – 88%; and
- Replacement of old pipework on a regular, systematic basis – 95%.

2.3.5 Conclusion

The Company is of the opinion that the proposals for AMP4 were consistent with customer views and expectations. We have since delivered against all outputs and improved in key areas of service such as call handling customer satisfaction. We will continue to meet these expectations in AMP5.

2.4 Other information

2.4.1 Analysis of company complaints

We monitor all complaints received on a monthly basis and these allow us to establish any trends in customer dissatisfaction. The complaints are discussed by the executive management team who will therefore be able to assess any issues in all parts of the business.

In previous years we have used this review to make changes to our business, for instance in the way we manage budget payments for customers. We have also identified from our complaints that customers do not always believe that their queries and later complaints are dealt with effectively on the first occasion. We also saw that around 24% of complaints were due to administrative errors. These issues also fed into the study work for our quality improvement initiative ' *Six Strands of Excellence*' in 2007 and 2008 which enhanced system and behavioural training for our contact agents and front-line staff.

We will continue to develop our customer experience improvements into AMP5 and a number of the process and system projects that are proposed will support our teams and provide better tools and allow us to serve our customers more effectively.

A couple of these initiatives have stemmed from complaints, along with feedback from the customer services agents, who have first-hand experience of customers' concerns. The first is the design of our bill. Customers often give feedback that they do not understand their bills. We have consequently initiated a project to that will allow us to print bills in a more consumer friendly manner and make them more user friendly. We expect to improve on the current design in a number of steps over the next few ears and into AMP5. Some customers have also complained that we send out our payment schedules at a different time to the bills. Customers feel that this is both complicated and wasteful. We are planning to change the programming of our billing system to allow simultaneous production of bills and payment schedules in AMP5.

2.4.2 Meter option feedback

The Company proactively promotes metering, and has the highest penetration rate in the country. On each occasion that a meter is fitted the customer is asked to complete a survey on the quality of the service they received, from their initial enquiry through to installation.

We do not receive a high proportion of these back and when we do customers are generally satisfied with the job that has been carried out.

One piece of feedback that we intend to improve upon is that customers feel that the three months it can take to install a meter is too long. We intend to improve on this in AMP5 and have already started to track the process so that we can align it with our Job Management System in AMP5. By 2015 we expect that most customers will have a meter installed and consequently this will be less of an issue.

3 Evidence of Stakeholder Views

The Company has also consulted with its consumers, including CCWater, the Environment Agency, and DWI.

3.1 Quadripartite meetings

We have worked closely and openly with the Consumer Council for Water (CCW) over our business planning process to once again ensure customer views are reflected in our plans.

In October 2007 we held a quadripartite meeting with CCW, Drinking Water Inspectorate (SWI) and the Environment Agency (EA) to review our draft SDS. We met again in January 2009 to review Final Plans

3.2 DEFRA Water Strategy

Better informed customers make better choices, and we know that the increased use of metering is a further spur to reducing demand without compromising our quality of life.

Defra Water Strategy, 2008

We are very supportive of DEFRA's Water Strategy which was published in 2008. We believe that our strategy, especially our Water Efficiency Strategy is closely aligned with DEFRA's vision and strikes the right balance in protecting both resources and customers.

3.3 Environment Agency

Near-universal metering is a cost effective option and can also help to reduce leakage levels, particularly in supply pipes. It also allows consumers to understand the true value of water by seeing how their actions affect how much water they use and pay for.

Environment Agency; Water for People and the Environment, 2009

We have reviewed the Environment Agency's (EA) recent report "Water for people and the environment" published in March 2009. This sets out its strategy for water resources in England and Wales. We believe our business plan along with water efficiency strategy aligns with the recommendations of this report.

3.4 Operational Consultation

We engage regularly at an operational level with both the EA and DWI and both parties are familiar with water resource situation and water quality issues faced by the company.

We have specifically engaged both on developing our long term plans, our SDS, and our draft Water Resource Management Plan.

We continue to involve both in dialogue about the levels of two pesticides, Clopyralid and Metaldehyde, at Ardleigh Reservoir and how this will be dealt with in AMP5. Our catchment management strategy will be in line with requirements of EA and DWI. We also will align it with strategies shared with neighbouring water companies and the water industry in general through Water UK, Government bodies (Pesticides Stewardship Group) and trade bodies (Metaldehyde Users Group).

3.5 Natural England

Natural England also gave us feedback on our long term plans, when we engaged it in the production of our SDS. It's response has been incorporated into our SDS and our business plan is consistent with this.

3.6 CCW

We engage with CCW in a number of ways.

3.6.1 Business Plan

CCW have been closely involved in our business planning process. Further to the quadripartite meeting with EA and DWI we invited CCW along to our public consultation with parish councillors.

We presented our draft business plan to CCW at a meeting at our offices on 7 July 2008. This included early indication of proposed future bills for our customers. Feedback from this meeting was given to the directors of Tendring Hundred Water at a review meeting on 14 July, to ensure that CCW's views were adequately taken account of.

We also met with CCW on 10 March 2009 to discuss our final plans.

We will continue to engage openly with CCW and keep them informed of our short and long term plans.

3.6.2 Annual audit

We are audited annually by CCW on complaints and debt recovery. These audits are extremely useful and we find it beneficial to receive independent feedback on our performance.

In respect of complaints, recent reviews have been fed into the current quality improvement work and we have considered the recommendations in our plans for AMP5.

Similarly we have explained our approach to debt management to CCW who have been supportive of our current initiatives and future plans.

3.6.3 Regional Meetings

We have quarterly meetings with the Central and Eastern region of CCW, chaired by Sir James Perowne. Many items are discussed at these meetings, including current and future service levels and plans for PR09.

3.7 Water resource Management Plan

In April 2008 we published our draft Water Resources Management Plan for consultation. It was sent to our key stakeholders. In addition it is was made available on the company website and was been placed in local libraries for public consultation.

This consultation has given increased transparency and openness to our planning process so that the public and non-governmental organisations can gain an improved understanding of how THWS will manage the supply-demand water balance until 2035. During this period, engagement with the public through the company website has been sought and customers have been encouraged to use a standard pro-forma for comments addressed to and for return to the Secretary of State.

Updates to establish the final draft plan were submitted to both the EA and DEFRA in January and March 2009. This plan forms the basis or our business plan submission.

4 Consumer Views and Cost Benefit Analysis

4.1 Introduction

The UKWIR common framework for capital maintenance planning provides companies with the mechanism, via its cost-benefit objective, to justify funding requirements based upon economic arguments, that is, aligning levels of service and serviceability with customers' willingness to pay.

Our business plan has been developed to meet business, regulatory and customer requirements for AMP5 and beyond. The linkage of investment requirements with the priorities of the business, customers and the regulator, over a suitably long time frame, forms the basis of effective asset management at PR09. Effective asset management ensures that an agreed level of performance output (as informed by Cost Benefit Analysis and making use of customer preferences) is delivered at an acceptable and agreed level of risk and with the minimum amount of investment.

The Investment Optimisation methodology and software used by THW

- undertakes Cost Benefit Analysis (CBA) with explicit reference to customers' views and values
- applies discounting within the forecasting of whole life costs used on the cost side of the cost-benefit analysis
- is a decision support tool in the formulation of the PR09 Strategic Business Plan and for long-term investment management

4.2 Overview of Investment Optimisation

The Investment Optimisation (IO) approach implemented by THW provides the ability to value a portfolio of investments.

4.2.1 Output Performance Measures

The optimisation method is founded on a set of output performance measures (OPMs). These are a set of measures that describe the output performance of the asset base.

They are the point where the performance of the asset base impacts on the success of the business, and are also at a level where customers can express a value for those relevant to them (i.e. the service-related OPMs), thus enabling customers' preferences to be used alongside business drivers. In addition, several OPMs have a bearing on socio-environmental damage.

The configuration of the THW Investment Optimisation (IO) model uses the following 15 OPMs:

1. Water Quality (Biological & Chemical)
2. Water Quality (Aesthetic)
3. Water Pressure
4. Supply Interruptions
5. Security of Supply Resources
6. Leakage
7. Sludge disposal
8. Extra Regulatory Reporting
9. Prosecution
10. Personal injury
11. Customer contacts
12. Carbon equivalent emissions
13. Staff productivity
14. Transport disruption
15. Avoided costs to business

4.2.2 Solution Valuation

Each potential investment solution is evaluated based upon the extent to which it would change expected performance against one or more of the OPMs over a 40 year time period. We believe this timeframe allows a fair comparison of the relative merits of short-through to long-lived assets and their effectiveness in delivering cost-beneficial service.

The value of each OPM is also articulated in the IO model based upon an understanding of:

- Customer willingness to pay for improvements in service;
- Social and environmental damage costs associated with service failure (i.e. the value of damage suffered by society or the environment); and
- Private costs associated with service failure (i.e. those costs incurred by the business in response to and as a result of the service failure).

By combining the extent to which service risk is mitigated together with the value of that risk to the customer, business and society, a monetary benefit for the solution is derived.

To ensure a robust economic appraisal, potential overlaps between different categories of value have been removed (e.g. GSS payments, as an attempt to internalise socio-economic damage, might appear in private costs and so should not also be given a damage value).

THW has used best practice in its research into eliciting customers' stated preferences This is the subject of a separate section in the commentary. This team has been integral to the correct economic application of valuations within the IO tool.

4.2.3 Solution costing

The costs (and savings) associated with the solution are also calculated over a 40 year time period. The types of cost included are:

- The initial capex, or capex profile where appropriate/available;
- The consequential repeat capex (based upon the spend of initial capex against assets with different life expectancies during the remainder of the 40 year period);
- Planned opex costs or savings; and
- Income (from grants and contributions).

4.2.4 CBA Valuation

In deriving the cost benefit value for each solution, the IO model calculates the discounted whole life cost of implementing the solution (over 40 years) and the associated discounted whole life monetary benefit delivered by that solution (over a 40 year period).

The discounted cost and benefit are combined to produce a Net Whole Life Cost or Whole Life Benefit for the solution.

5 Service levels, consumer priorities and customer bills

In summary, feedback from our customers is that primarily they do not want services to deteriorate. They place a high importance on water safety and would like to see the company being more proactive on water efficiency. Customers generally felt our draft plans were value for money, however some 18% disagreed on the basis that our bills are too expensive already. On this basis and given the current downturn in the economy we have substantially reduced our investment proposals since the draft was submitted in August 2008.

We have achieved these goals through the capital maintenance targets we have set which primarily focus on maintaining service levels as they are with improvements in communication and metering which will drive home the water efficiency message.

Our improvements in customer experience are generated from base opex, taking account of the proposed modernisation of our processes and systems.

C2 – Cost Base, Benchmarking and Efficiency Studies

Contents

1 OVERVIEW

This submission has been prepared in accordance with the information requirements issued by Ofwat in the Business Plan – Company Guidance, dated December 2008. The information provided represents the general approach, methodology and data sources used by Tendring Hundred Water Services (THWS) to establish a set of standard costs which form the cost base submission for the fifth Regulatory Periodic Review (PRO9).

The submission includes tables C2.1 – C2.4 and C2.9 with commentaries and associated cost breakdown structure (CBS), which splits up the component parts of the cost build up. Where it has not been possible to align our system for capturing costs with the structure in the CBS tables, for example, where those elements are embedded in the direct costs of the contractor and cannot be disaggregated, this has been explained in the assumptions column to make it clear where the costs have been included.

Presented here is our current view of the estimated standard and unit costs of capital works required for our investment programme for the next quinquennium. The information given is based on sources of information available to the company consistent with those used to estimate the costs of our forecast capital programmes.

Standard costs have been completed only for those expenditure categories that represent 2% or more of planned expenditure for each main activity area for AMP5.

Infrastructure standard costs have been derived from The Company's Period Contract and THWS outturn costs. Non-Infrastructure standard costs have been based upon detailed component estimates and company outturn costs.

The company operates in the south eastern area of the country 40 miles from London and is subject to the demands for labour materials and services that exist in this region and the higher rates these services command. Construction in major specialist projects in London has led to a high demand for skilled labour and materials and this in turn has increased the rates charged by local contractors. We believe this will increase in the immediate future. We have not made any specific adjustments for additional costs within the submission

THWS has compiled its standard cost submission entirely independently of other water and sewerage companies outside of the Veolia group.

Nevil Muncaster
Managing Director
07 April 2009

2 Methodology and Data Sources

2.1 Summary

In line with section 2 of the Ofwat company guidance, standard costs have been completed only for those categories that represent 2% or more of planned expenditure for the activity area. The specific breakdown of planned expenditure is shown in Table C2.1 and Table C2.3.

We have made an assessment, for each category that represents 2% or more of planned expenditure, to determine the number of standard costs to submit. We note that Ofwat requires a minimum of one standard cost for each category even if this is not representative of the work that THWS are expecting to undertake in AMP5.

The actual standard cost that have been completed for THWS are shown in the tables below. We are submitting a standard cost for category A expenditure (water treatment works) even though this does not represent work that we expect to undertake.

2.1.1 THWS Non - Infrastructure Standard Costs Submitted

Table Ref.	Description
C2.4.8	Refurbishment of rapid gravity filters, output 20Ml/d
C2.4.10	New service reservoir, capacity 4Ml
C2.4.12	Replacement of variable speed pumps, output 6 to 9Ml/d
C2.4.14	Replacement motor control centre for an existing variable speed pumping station, 90kW total installed motor capacity

2.1.2 THWS Infrastructure Standard Costs Submitted

Table Ref.	Description	Detail
C2.2.1	Mains laying nominal bore 100mm	Grassland
C2.2.1	Mains laying nominal bore 150mm	Grassland
C2.2.1	Mains laying nominal bore 200mm	Grassland
C2.2.1	Mains laying nominal bore 300mm	Grassland
C2.2.2	Mains laying nominal bore 100mm	Rural / Suburban
C2.2.2	Mains laying nominal bore 150mm	Rural / Suburban
C2.2.2	Mains laying nominal bore 200mm	Rural / Suburban
C2.2.2	Mains laying nominal bore 300mm	Rural / Suburban
C2.2.3	Mains laying nominal bore 100mm	Urban
C2.2.3	Mains laying nominal bore 150mm	Urban
C2.2.3	Mains laying nominal bore 200mm	Urban
C2.2.3	Mains laying nominal bore 300mm	Urban
C2.2.5	Mains laying (DD) nominal bore 100mm	Urban
C2.2.5	Mains laying (DD) nominal bore 150mm	Urban
C2.2.5	Mains laying (DD) nominal bore 200mm	Urban
C2.2.7	Mains rehabilitation nominal bore 100mm	Pipe insertion
C2.2.7	Mains rehabilitation nominal bore 150mm	Pipe insertion
C2.2.7	Mains rehabilitation nominal bore 200mm	Pipe insertion
C2.2.8	Communication pipes	New long side
C2.2.8	Communication pipes	New short side
C2.2.8	Communication pipes	Renew long side
C2.2.8	Communication pipes	Renew short side
C2.2.9	Internal meters	New
C2.2.9	Internal meters	Renew
C2.2.10	External meters excluding boundary box	New
C2.2.10	External meters excluding boundary box	Renew
C2.2.11	External meters including boundary box	New
C2.2.11	External meters including boundary box	Renew

Our capital works are procured either directly by the company or through Veolia central procurement services who effectively operate as a department of the company in this respect.

2.1.3 Future Capital Investment Programmes

The standard and unit cost estimates have been used to evaluate the capital investment required in support of capital maintenance, supply/demand balance and to establish Modern Equivalent Asset values (MEA).

2.2 General Methodology

The methodology followed by the company in the preparation of infrastructure and non-infrastructure standard costs for this submission, is set out in the following documents:

- Cost Base Submission Methodology – December 2008
- Unit Costs Methodology and Models – January 2009

These documents have been reviewed by the Reporter and cross-checked against our submission.

Our methodologies clearly demonstrate the link between standard costs developed for this submission, and unit costs developed for assessing the value of our assets and the cost of future capital expenditure. A consistent approach has been followed in the development of both sets of costs, utilising common sources of information and common procedures.

This approach is consistent with the guidelines set out in the Final Business Plan Information Requirements published at the end of December 2008.

Costs have been produced as part of a continually developing programme of cost modelling to enable investment expenditure to be estimated on the basis of the best information available.

2.2.1 Summary of Treatment Process Solution

The water treatment works standard cost we have submitted is for refurbishment of rapid gravity filters, output 20 Ml/day.

The refurbishment of the gravity filters was largely specified except for the number of filters and the filtration rate. The selection of filtration rate is something that would occupy a considerable amount of debate when installing new filters but for a filter refurbishment is controlled by what is there. Accordingly the nominal area of 120m^2 was selected (filtration rate >7 m/h after allowing for the filtration of backwash water).

Most of our stations of this size have 4 filters and so this was selected. The number of nozzles follows the typical density of 45 /m^2. Normally we would not install slow start together with filter run to waste but with the hardware and automation required slow start would be a no cost option (based on likely reduction offered by contractor for removing it).

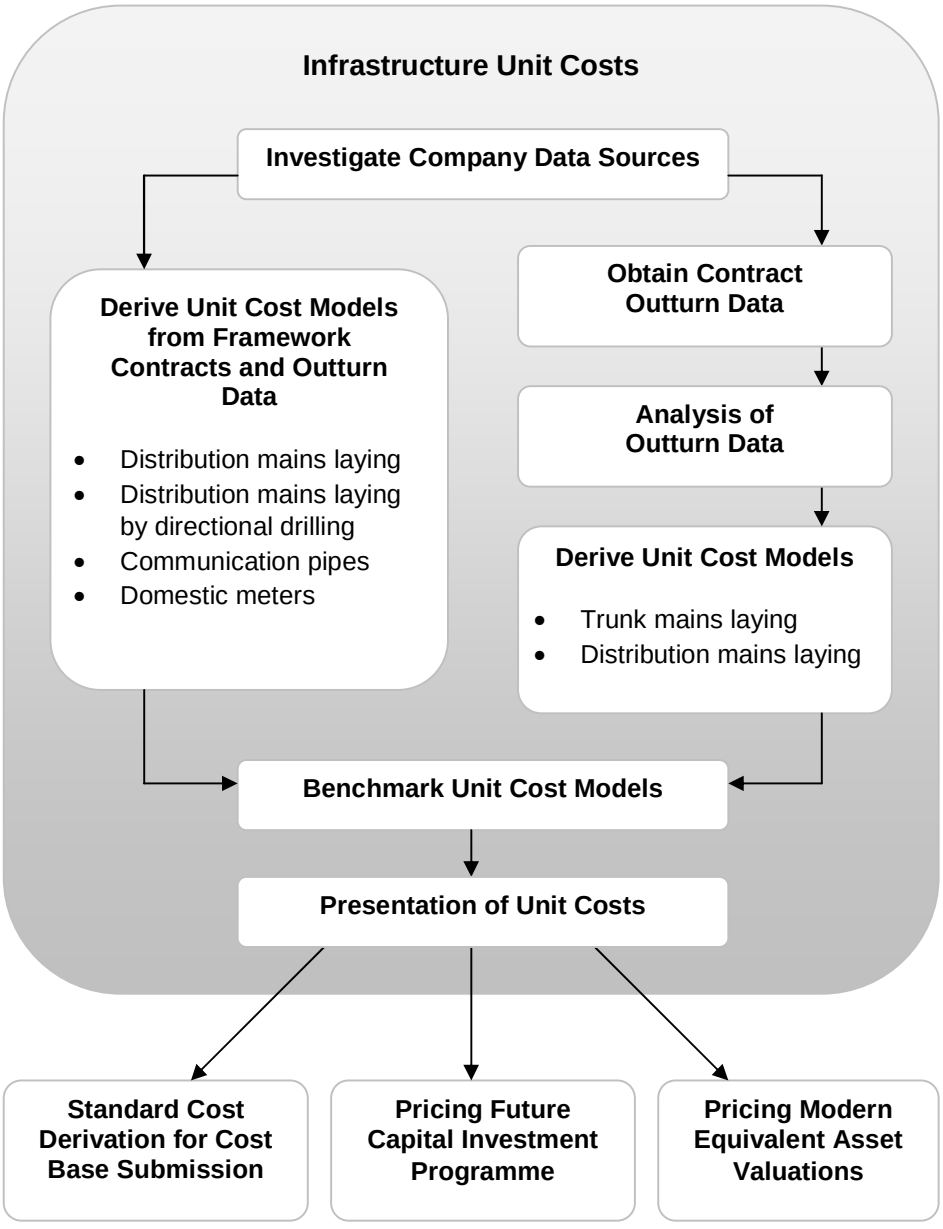
In the normal approach for the business plan the problem is reviewed from the basis of the quality and capacity issues. Water quality guidance, particularly on aspects of the water safety plan is taken into account and a number of potential solutions may be proposed. Generally these are tested for feasibility and the scope generated by a small panel to review their likely effectiveness before the costing stage. This will also incorporate information about the site such as the available land and buildings power supplies, trunk mains drainage roads and a number of other factors. One of the key factors is the condition of the existing system and its suitability for any revised role. In the standard costs these factors have generally been either stated or are described in the assumptions and are largely written out of the consideration. The scheme scope will generally include bringing all affected systems up to the company standard that is currently applicable (e.g. security systems)

From this filtering process a reduced number of viable options is then costed either using specific costs for components either from previous projects or estimates obtained from contractors / suppliers or the application of units costs.

2.2.2 Infrastructure Standard Costs

The general approach adopted for the derivation of infrastructure standard costs for the Cost Base submission is summarised in Figure C2.1(3) below. Two approaches have been followed, both seeking to make use of the most reliable information available.

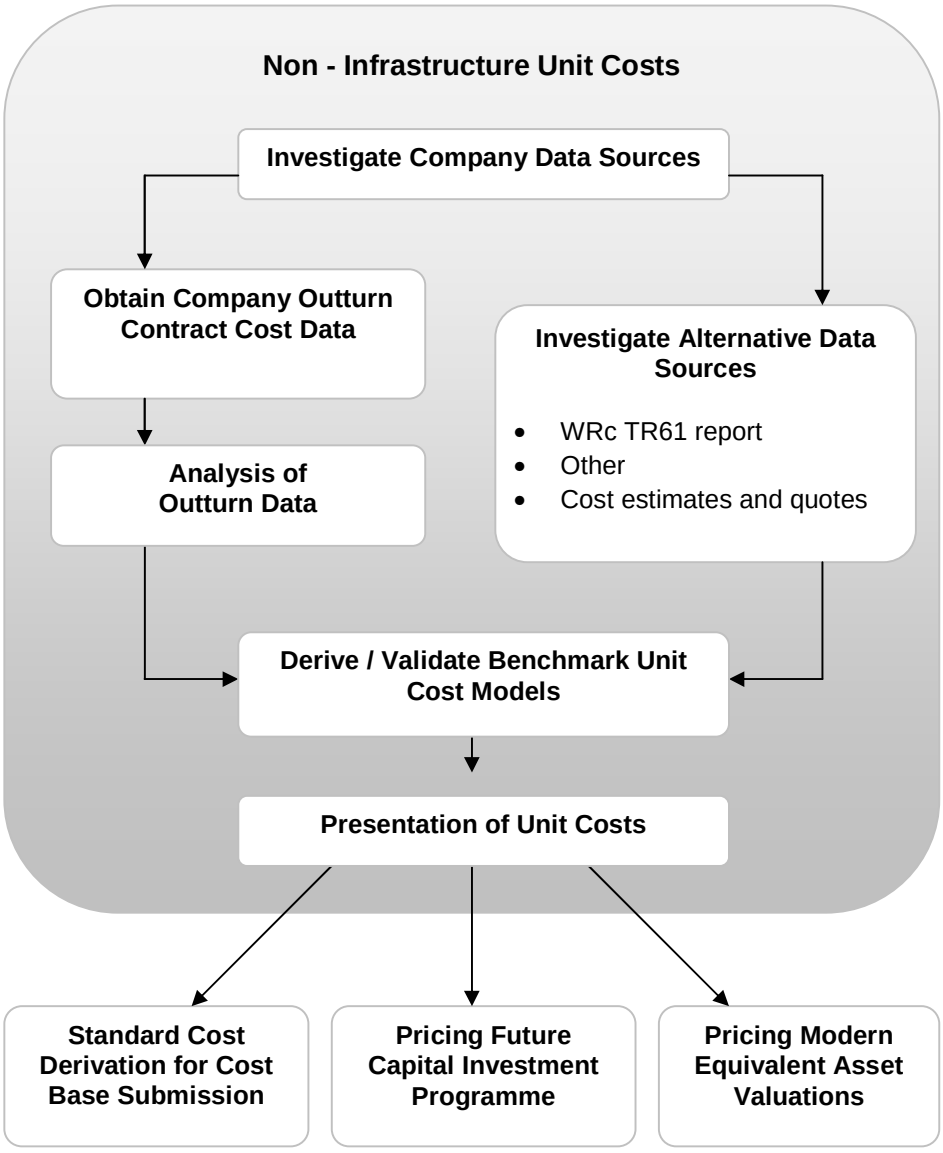
Figure C2.1 (3): Summary Methodology Infrastructure Standard Costs



2.2.3 Non Infrastructure Standard Costs

The general approach adopted for the derivation of non-infrastructure standard costs for the Cost Base submission is summarised in Figure C2.1(4).

Figure C2.1 (4): Summary Methodology Non-infrastructure Standard Costs



2.2.4 Indirect Costs

Our approach to indirect costs has been to use the best information available and the values used in the standard costs reflect the values used in the business plan.

Indirect costs for potable mains and communication pipe infrastructure standard costs are assessed at 4.75%, as assessed by our period works contractor Claret.

Metering indirect costs are assessed as monetary values taken from direct outturn cost data from the THWS metering programme. These outturn costs are from our financial accounting system.
Finally indirect costs for non-infrastructure standard costs are assessed at 7% for design (from inception to detailed design), 18% for commissioning, project management (including planning and quality audits, contractor overheads and profit), and a further 18% for construction management (including prelims, site supervision and site overheads). These indirect cost percentages are based on an assessment of these costs across a range of non-infrastructure projects carried out across the Veolia group companies.

We have not made any pain/gain adjustment at either project or programme level.

2.2.5 Corporate Overheads

Our approach to corporate overheads has been to assess the level of capitalised cost as a percentage of the projected future capital programme. The corporate overhead percentage used in the standard costs reflects the percentage used in the business plan.

The corporate overhead percentage is 9.9% and includes costs for asset management, procurement, project management and allowances for time spent on capital projects by members of the finance, regulation and senior management teams.

2.3 Sources of Data

2.3.1 Infrastructure Costs

For the infrastructure standard costs for the items listed below, the installation components have been derived from the Period Works Contract we have in place in 2007/08.

- Distribution mains laying (up to and including 300mm)

- Directional drilling
- Communication pipes

The company carries out its metering programme in house and thus metering standard costs are based on actual THWS outturn costs as recorded in the financial accounting system.

2.3.2 Non-Infrastructure Costs

The non-infrastructure standard costs have been based upon the following sources of data, listed in descending order of priority of usage:

- Company scheme out-turn costs
- Detailed component estimates
- Nationally derived data from the WRc TR61 Cost Estimation Software.

A number of unit cost models have been produced relating capital costs to a key variable dependant on the model under consideration, e.g. 'throughput' for a treatment process.

These models are used where possible as the basis for standard cost estimates, with appropriate additions or subtractions being made as necessary to accord with the standard cost definitions. However, in many cases where our unit cost data is insufficient to establish robust unit cost models, detailed scheme specific standard cost estimates have been prepared on a bottom up basis.

Our general methodology detailed above sets out how we have achieved consistency between our unit costs used in the business plan submission and the standard costs developed for the cost base submission.

THWS has compiled its standard cost submission entirely independently of other water and sewerage companies outside of the Veolia group. We can also confirm that we have not exchanged technical information on design or process solutions with companies outside of the Veolia group.

2.4 Changes from Draft Cost Base Submission

2.4.1 Infrastructure Standard Costs

Following discussions with our period works contractor and a review of recent and current projects we have concluded that no changes to our infrastructure costs will be necessary for the Final Business Plan

2.4.2 Non-Infrastructure Standard Costs

Non-infrastructure standard costs are lower than those submitted in the draft cost base submission following a review of our approach. We have strengthened the link between our standard costs and investment unit costs by using the same schedule of renewable items to price both. Where we have been able to use renewable item costs in the standard cost build up we have done so. Some renewable item costs have not been used where the specification in the cost base guidelines does not match the specification of the renewable item. We have provided our Reporter with the new cost breakdown schedules detailing every change we have made to each standard cost. The effect of the changes made to standard cost pricing by using renewable item costs is summarised in the table below.

Table C2 : 4 Non-infrastructure Standard Cost Changes

Table Ref.	Description	Change %
C2.4.8	Refurbishment of rapid gravity filters, output 20Ml/d	+16.0%
C2.4.10	New service reservoir, capacity 4Ml	-8.0%
C2.4.12	Replacement of variable speed pumps, output 6 to 9Ml/d	-30.0%
C2.4.14	Replacement motor control centre for an existing variable speed pumping station, 90kW total installed motor capacity	-21.0%

Non-Infrastructure Unit Costs

Non-infrastructure unit costs remain based on the schedules of renewable items that were developed for the draft cost base submission.

2.5 Definitions

The company has used the following general definitions to aid clarity of approach in determining the various costs and estimates required:

- *Unit costs* are based on our actual circumstances and represent the average costs to the company for the defined element of work. These are used for the derivation of estimates of capital investment needs, and for the valuation of our assets
- *Standard costs* are based on the definitions contained within the Ofwat guidelines, and are not necessarily representative of works we will carry out.

2.6 Base Year and Cost Indexation

The base year for all standard costs used for this Cost Base Submission is 2007/8 as defined in the Information Requirements.

Where historic contract out-turn data has been used, cost indexation to the base year has been carried out using the Construction Output Price Inflation (COPI), published by The Stationary Office on behalf of the Department for Trade and Industry.

2.7 Confidence Grades

Confidence grades have been applied to each of the standard cost estimates in accordance with the guidelines set out in the Information Requirements. Our approach to applying the confidence grades has been reviewed with our reporter.

2.8 Local Factors

The company operates in the south eastern area of the country 40 miles from London and is subject to the demands for labour, materials and services that exist in this region and the higher rates these services command. Construction in a number of major specialist projects in east London has led to a very high demand for skilled labour and materials and this in turn has driven up the rates of contractors in the local construction and engineering sectors. We believe this demand will increase in the immediate future. The information we have received from our period works contractor Claret Civil Engineering Ltd would suggest that they experience operating costs that are between 10-15% higher than contractors in other parts of the country.

Appendix A - Cost Base Tables

3 Table C2.1 - Water mains projected expenditure

Table C2.1 gives an indicative breakdown of total investment on water mains and mains renovation by project type and location, and indicates the percentage of the components of capital expenditure for the period 2010-15 estimated now.

The percentage allocation between surface types (lines 1-3) has been derived based on recent experience of length laid in each environment and following a review of the most probable future work locations.

Since all rehabilitation work carried out under the quality programme was completed in the AMP2 period, no investment is anticipated using surface applied coatings or slip lining. Wherever practicable existing mains are renewed using pipe insertion. Some mains are likely to be renewed by pipe bursting but total lengths will be limited to avoid damage to other utilities and surfaces due to heave.

4 Table C2.2 - Water infrastructure standard costs

4.1 General Comments

In accordance with the guidelines set out in the Final Business Plan Information Requirements, the standard cost estimates submitted in Table C2.2 have been compiled from Company cost data wherever possible.

These represent the best estimates for the average cost to the Company in carrying out works that comply with the standard cost specifications provided.

4.2 Mains laying

The main laying standard costs and the build up of these is set out in the Standard costs Methodology and Models document March 2008, produced by Franklin Andrews Consultants on behalf of the Company.

Standard cost models have been produced by adjustment of the aggregated components within a unit cost model, to meet the specification shown in the Ofwat standard cost assumption checklist.

4.2.1 Diameters up to and including 300mm - lines 1 to 4

The following documentation and sources of data have formed the basis for the standard cost estimates for mains of 300mm diameter or less.

- Material prices supplied by Veolia Central Procurement Services, which procures materials for all the group companies.
- Tendring Hundred Water Services – Period Works Contract THWS/1 – September 2006 – March 2008, Claret Civil Engineering Ltd.

4.2.2 Fittings frequencies

These have been taken from Table 3: Table of Frequencies, in the Information Requirements.

4.2.3 Standard Costs

The standard costs have been calculated for new water mains on a Company specific basis, assuming open trench construction techniques by aggregating the following principal components:

Material Costs

The pipe material upon which the standard costs have been based is

- 50% MDPE / 50% HPPE.

in accordance with current practice within the company.

The materials costs for each individual fitting have been calculated to include all elements necessary to enable that particular fitting to be properly installed i.e. couplings, chambers, valve boxes etc. Costs have been calculated for a comprehensive range of fittings including bends, tees, valves, air-valves, washouts, hydrants and mains connections.

Total materials costs have been calculated by taking the individual fittings costs at the quoted frequencies of occurrence, and adding the actual mains costs.

Installation Costs

Installation rates have been provided directly by our period works contractor Claret Civil Engineering Ltd.

These rates include for laying the pipes and fittings, excavation, bed and surrounds, backfilling and disposal of surplus material. The rates have been taken for a depth of cover of 900mm, and the relevant exclusions made.

Common Items

The common items element of the standard costs includes necessary elements not included in Period Works linear rates:

- Trial pits for service location.
- Preparation of working width including easements, compensation and fencing.
- Control telemetry cables and ducts.
- Marker posts and indicator plates.
- Minor crossings of ditches, hedges and paths.
- Hydraulic testing and cleaning.

The relevance of the common items for each standard cost estimate has been assessed on the basis of the diameter of the main and the surface type category.

Reinstatement

Reinstatement costs have been calculated for each surface type as defined below:-

- Grassland - to include fields (arable and pasture), verges, sports fields, golf courses and similar areas where there is no 'hard' surfacing. These costs are based on the assumption that topsoil has to be stripped and replaced from the working area, and also include for repairs to field drains.

- Rural/suburban highway surfaces - to include less trafficked roads such as in rural areas and suburban housing estates. These costs include for saw cutting and breaking up of the existing surface, imported granular backfill and an element of traffic management. Surface reinstatement assumes first time permanent reinstatement Type 3/4 in accordance with the New Roads and Street Works Act 1991.

- Urban highway surfaces - as for rural/suburban highways, but to urban carriageway specifications. The Company has used Type 2 rates for first time permanent reinstatement using flexible road construction, this being the cheapest method. In practice there will be occasions when interim reinstatement is required, the costs of which are not included in these standard cost models.

Project On-Costs

Appropriate allowances have been made for on-costs including studies, design, specialist fees, supervision, and company procurement overheads.

The engineering judgement grade of B2 has been applied to these standard costs to reflect the Company specific nature of the Period Works Contract rates used.

4.2.4 Mainlaying by Directional Drilling – lines 5,6 and 7

An identical approach has been taken for directional drilling as for mainlaying up to 300mm, with contract rates being applied for drilling as opposed to open cut. There are some minor adjustments for reinstatement areas that were included in open cut rates.

The engineering judgement grade of B2 has been applied to these standard costs to reflect the Company specific nature of the Period Works Contract rates used.

4.3 Mains Rehabilitation

Since all rehabilitation work carried out under the quality programme was completed in the AMP2 period, no standard costs have been submitted for surface applied coating or slip lining. The pipe insertion standard costs have been based on Company specific Period Contract Rates.

4.4 Communication Pipes

The communication pipe standard costs and the build up of these, is set out in the Standard Costs Methodology Report - March 2008, produced by Franklin Andrews Consultants on behalf of the Company.

Communication pipe standard costs have been calculated on a Company specific basis, assuming 50% in open trench and 50% using thrust bore techniques, consistent with Company practice for the following types of installation:

- New (line 11) - Laid in new housing estates etc. where the contractor/developer is responsible for the costs of reinstatement.
- Renewal (line 12) - Laid within existing surfaces and therefore include the costs of breaking up and reinstating the surface.

Standard costs have been calculated for both short and long side connections, based on the specified length of 7m and 3m for long and short sides respectively.

Standard cost models have been produced by adjustment of the aggregated components within a unit cost model, to meet the specification shown in the Ofwat standard cost assumption checklist.

4.4.1 Installation Costs

Installation rates have been calculated by summing the appropriate rates from the Period Works Contract for the installation of communication pipes. The rates have been taken for a depth of cover up to 900mm.

4.4.2 Reinstatement

Rates have been taken from the Period Works Contracts for permanent reinstatement of footpath and rural/suburban highway. Average areas of reinstatement have been calculated based upon the specification of the Period Works Contracts.

4.4.3 Project On-Costs

Appropriate allowances have been added for on-costs including planning, design, supervision, and company procurement overheads.

The engineering judgement grade of B2 that has been applied to these standard costs reflects the Company specific nature of the Period Works Contract rates used.

4.5 Household Meters

The household meter standard costs and the build up of these is set out in the Standard costs Methodology and Models Report - March 2008, produced by Franklin Andrews Consultants for the company.

Meter standard costs have been calculated on a Company specific basis in accordance with the guidance given in the Information Requirements.

The installation of new external meters including a boundary box, covers a significant proportion of the anticipated programme of meters expected to be installed in the PR09 period.

Costs have been calculated for the following circumstances, as laid down in the Ofwat checklists:

- Internal: approximately 3% of new meters are installed internally at present.
- External excluding boundary box: approximately 94%of new meters are fitted in existing meter boxes at present.
- External including boundary box: approximately 6% of new meters are installed externally in new boundary boxes at present.

The engineering judgement grade of B2 that has been applied to these standard costs reflects the Company specific nature of the Period Works Contract rates used, together with the assumptions made in producing the standard costs.

5 Table C2.3 - Water Service – Composition of expenditure by asset type

Table C2.3 gives an indicative breakdown of total investment by project type and location and indicates the percentages of the components of the capital expenditure for the period 2010-2015 estimated now. As the proposed investment is still under development the percentages indicated are likely to change.

Lines 1,2,3 and 9 The company has carried out a full review of all its non infrastructure facilities for PRO9 and the proposed investment in Water Resources, Water Treatment and Management and General reflect the required expenditure necessary to maintain our current levels of service and to update and upgrade our equipment such as Telemetry and computer systems

The proposed expenditure in Storage and Pumping stations represents the final stage of a long term plan, begun in AMP2, to upgrade these facilities and includes the replacement of a storage reservoir at Dovercourt near the port of Harwich with a new 6Ml capacity reservoir and pumping station.

6 Table C2.4 - Water non-infrastructure standard costs

6.1 General Comments

In accordance with the guidelines set out in the Final Business Plan Information Requirements the standard cost estimates submitted in Table C2.4 have been compiled from Company cost data wherever possible.

These represent the best estimates for the average cost to the Company in carrying out works that comply with the standard cost specifications provided.

Standard cost models have been produced by aggregating the components of cost shown in the Ofwat standard cost checklist.

The non-infrastructure standard costs have been based upon unit cost models created from the following sources of data, listed in descending order of priority of usage:

- Company specific scheme out-turn costs.
- Group wide out-turn costs.
- Detailed scheme estimates produced within the group.
- Nationally derived data from the WRc TR61 software.

A number of unit cost models have been produced relating capital costs to a key variable e.g. 'throughput' for a treatment process. These unit cost models and the back-up summaries for the data sets used are set out in the Unit costs Methodology and Models report March 2008, produced by Franklin Andrews Consultants on behalf of the Company.

These unit cost models have been used where possible as the basis for standard cost estimates, with appropriate additions or subtractions being made as necessary to accord with the standard cost definitions, and to ensure that the relevant site-specific elements of cost have been excluded. However, where no unit cost models satisfactorily cover the standard cost definitions, specific standard cost estimates have been produced.

Where historic contract out-turn data has been used, cost indexation to the base year of average 2007/8 has been carried out using the Construction Output Price Index (COPI) published by the Department of Trade and Industry.

6.2 Non-Infrastructure Assets

Lines 1 to 7 and line 9

Standard costs have not been submitted for the following projects since they are not currently included in the Companies PRO9 capital programme:

- New treatment works type SW4, 30 Ml/d - line 1.
- Replacement filtration system at treatment works type SW4, 30 Ml/d - line 2.
- New abstraction borehole treatment works, 8 Ml/d - line 3
- New plumbosolvency control to existing borehole treatment works, 8 Ml/d – line 4
- Alterations to water treatment works type SW4, 30 Ml/d – line 5
- Installation of a nitrate removal plant at a borehole treatment works, 10 Ml/d – line 6
- Cryptosporidium protection to an existing borehole treatment works, 2.5 Ml/d – line 7
- Replacement of disinfectant plant Line 9

Refurbishment of rapid gravity filters output 20Ml /day - line 8

The principal element of this standard cost is the unit cost model for refurbishment of rapid gravity filters derived from group specific data, from which deductions have been made to bring the standard cost estimates in line with the definitions. The engineering judgement grade of B3 reflects this approach.

New service reservoir, 4Ml line 10

The principal element of this standard cost is the unit cost model for new service reservoir derived from company specific data, from which deductions have been made to bring the standard cost estimates in line with the definitions. The engineering judgement grade of B3 reflects this approach.

Lines 11 and 13

Standard costs have not been submitted for the following projects since they are not currently included in the Companies PRO9 capital programme

- Refurbishment of service reservoir, 6Ml - line11
- New Fixed speed pumpset output 10Ml/d - line 13

Replacement of variable speed pump output 6 to 9 Ml/d – line 12

The principal element of this standard cost is the unit cost model for Replacement of variable speed pumps derived from group specific data, from which deductions have been made to bring the standard cost estimates in line with the definitions. The engineering judgement grade of B3 reflects this approach.

Line 14 Replacement MCC for existing variable speed pumping station, 90kW

The principal element of this standard cost is the unit cost model for replacement MCC derived from group specific data, from which deductions have been made to bring the standard cost estimates in line with the definitions. The engineering judgement grade of B3 reflects this approach.

7 Table C2.9 – Water Service Standard costs- Comparison with PRO4

This table compares certain standard costs submitted for PRO9 with costs submitted for PRO4 adjusted to 07/08 prices

Lines 1-3 The grassland rates entered have been provided by our current period works contractor Claret and are reflective of the expected outturn costs for these particular jobs. Whilst there is a substantial increase on the price adjusted costs provided for the previous submission, those rates used a constant low figure for contractor labour which we would not expect to achieve now.

Line 10 shows the rate for a new service reservoir capacity 4Ml. The Company confirms that the figures provided are consistent with actual contract costs we have been able to achieve for similar work carried out in 07/08

C3 Asset Inventory

Contents

1 OVERVIEW

1.1 Introduction

The Company confirms that the asset inventory is based on a full re-survey of its entire asset base. The re-survey process included a visit to each site operated by the Company, to check and amend if required, the accuracy of the data held against each item listed in the previous inventory. Additional items were also added in order to provide a more detailed and up to date list of components.

Due to the small size of the company and the small number of assets, the re-survey has been carried out by physical inspection of all above ground assets. Data in the asset inventory has been updated with the findings of the re-survey which confirmed the component description, manufacturer's details, year of installation and where possible, remaining life. The remaining life gave an indication of the condition grade of the component.

The Company operates 15 submersible borehole pumps and for many years these have been replaced on failure. The life of individual borehole pumps varies considerably but the average life is stable at about 7 years which has been used to estimate the expenditure needed and assign notional condition grades.

Underground assets have been reviewed by removing sections of main which have then been sent for condition analysis. The data from this analysis has been used to calibrate the mains performance model, maintained on the Company's behalf by the Veolia Group (the 'Group'), which has been developed for mains failure prediction.

GMEA valuations are generally based on unit cost models developed and consistent with standard costs submitted with the cost base. For the purpose of asset valuation, revised unit costs for non-infrastructure assets, developed jointly within the Veolia Water Group by Franklin & Andrews, have been used for asset revaluations even where these have not been submitted with the cost base. Where a revised unit cost model has not been available the 2002/3 value has been adjusted to 2007/8 by RPI (+17.9%).This provides a high level of confidence in the results and has resulted in the allocation of a confidence grading of A2.

The main limitations of the process have been that there are too few assets to have a steady base expenditure profile. Any major replacement or refurbishment results in a dramatic increase in expenditure and "lumpy" expenditure profile.

1.2 Changes made between draft and final.

A review of the Asset Inventory was carried out with respect to the categorisation of Assets and Components. It was noted from the Reporters comments that there are a number of instances where the methodology of deducting the component value from the

asset value to arrive at a balancing figure had arrived at the wrong result due to misalignment of the data. This was addressed by using the asset valuation in its entirety to arrive at the GMEA valuation. The component values were used to provide an indication based on remaining asset life of the likely component replacement expenditure required for each asset group. Full asset replacements predicted by the tool could be reviewed to decide if the replacement was appropriate or if refurbishment to increase the remaining asset life would be the appropriate intervention. In general this is always the most cost effective option unless there are other contributing factors identified. An example of this is the replacement of Dovercourt Reservoir which will provide the appropriate amount of storage for the population served in accordance with the treated water storage strategy.

A further exercise reviewing the asset type categorisation was carried out with a number of assets being assigned to a different asset group. In particular the service reservoirs at Ardleigh and Horsley Cross were assigned to the treatment works but have been changed to the service reservoir group. The result has been a reduction in the overall GMEA values of the two treatment works with an increase showing against the service reservoirs.

The Table 1 definitions for Condition Grades have been consistently applied to all assets and components. A grade of 1 has been assigned to decommissioned assets to reflect there being no deterioration or investment forecast for these assets. There is also no value showing against any decommissioned asset. As part of the review a small number of assets were identified as having no condition grade and these gaps have been filled. The condition grades were assigned as a result of visual inspection of the assets combined with an intimate knowledge of each of the assets due to their small number.

Predicting remaining asset lives using a statistical approach was not possible due to insufficient historical data.

Following the review the asset value in each asset condition was reassessed and found to be broadly consistent with 1997-98 and 2002-03 positions as shown in tables C3.2. The most striking differences are proportions of the value of services reservoirs and booster pumping station assigned to Grade 1. These changes are due to the inclusion of the new reservoirs and pumping stations at East and West Clacton.

The unit cost models used to calculate the asset values were recalculated prior to the Draft submission by Franklin and Andrews on behalf of Veolia Water Group. For the draft plan some of these models were applied and for some models the original values were increased by RPI. For this submission all valuations were updated with the latest Franklin and Andrews models. RPI has only been applied to lower value items such as access roads and fences where no updated model is available.

Finally in response to the additional guidance provided to companies which includes a requirement to provide a cumulative graph showing bursts against pipe length a table showing the Cohort breakdown and graph of bursts has been included in this commentary in section 2 Condition grading.

1.3 Effects of revaluation on CCD

The re-valuation process has had limited effect on CCD for existing assets, with a step increase as a result of the addition of the new service reservoirs and pumping stations at Brightlingsea, East and West Clacton.

Changing asset lives has had minimal effect on CCD carrying forward into AMP6 and subsequent AMP periods.

The greatest single change in GMEAV has been to the dam structure at the Ardleigh Impounding reservoir, where the value has been increased annually over the last five years by RPI, which equates to a cumulative increase of 17.9%. Other GMEAVs have changed by a similar percentage but are not as significant due to their smaller value. An allowance for the value of the virtually completed East and West Clacton reservoirs and pumping stations has also been included.

The Company confirms that the asset condition grades applied are consistent with those described in the guidance documentation for non-infrastructure and with those in the UKWIR Methodology "Review of Water Mains Serviceability Indicators and Condition Grading: Volume 2 – Mains Condition Grading" (UKWIR, 2007), for the infrastructure assets.

Comparing the percentage GMEA valuation against Asset Type and condition grade with the previous assessment shows that although there are slight differences the breakdown remains largely consistent. The main differences appear on the Service reservoir line due to the construction and commissioning of two new reservoirs and the subsequent decommissioning of two old structures, and on the Booster pumping line due to the addition of new booster pumping stations as part of the same project. At the time of the revaluation exercise the construction of East and West Clacton reservoirs and pumping stations was nearing completion so 95% of their full value was attributed to those assets.

1.4 Information systems and asset management planning

The Company maintains comprehensive databases for above and below ground assets. The Geographical Information System [GIS] is the database for underground assets and is continuously updated with all details of bursts, replacements, new connections etc. The GIS is the source of data for the underground asset models which have formed the basis of the infrastructure Capital Maintenance programme.

For the 2007/08 re-valuation exercise for above ground assets the 2002/03 asset valuation spreadsheets have been comprehensively reviewed and checked against the actual assets by observation. Valuations of specific asset types have been sought from the manufacturers and have been included. Unit cost models have been reviewed and recalculated and where updated models were not available or inappropriate, the 2002/03 value has been inflated by 17.9% RPI. At PR04 the asset inventory was used as the source of the capital maintenance programme for asset replacement, this has also been used for PR09 as the re-survey has given a high degree of confidence that the remaining asset lives allocated to the assets fairly predicts the future replacements. We note that the match is not 100% due a number of items, including the new work

management systems and the replacement treated water reservoir and pumping station at Dovercourt.

During the remaining years of AMP4 the Company will commence the introduction of a Work Management System, this will be fully integrated into the operation of all areas of the business and will facilitate information collection and retrieval on all of the assets both above and below ground. Their performance and the amount and timing of any work carried out on assets will be recorded for subsequent analysis. Detailed information on each asset will be checked and updated as part of the daily routine.

The fixed asset register is linked to table 33 of the June return and is performing well, it has been allocated a confidence grading of A2.

2 Asset Condition Grading

2.1 Infrastructure assets

Infrastructure assets condition and performance grading has been carried out as part of engineering studies for PR09 comprising:

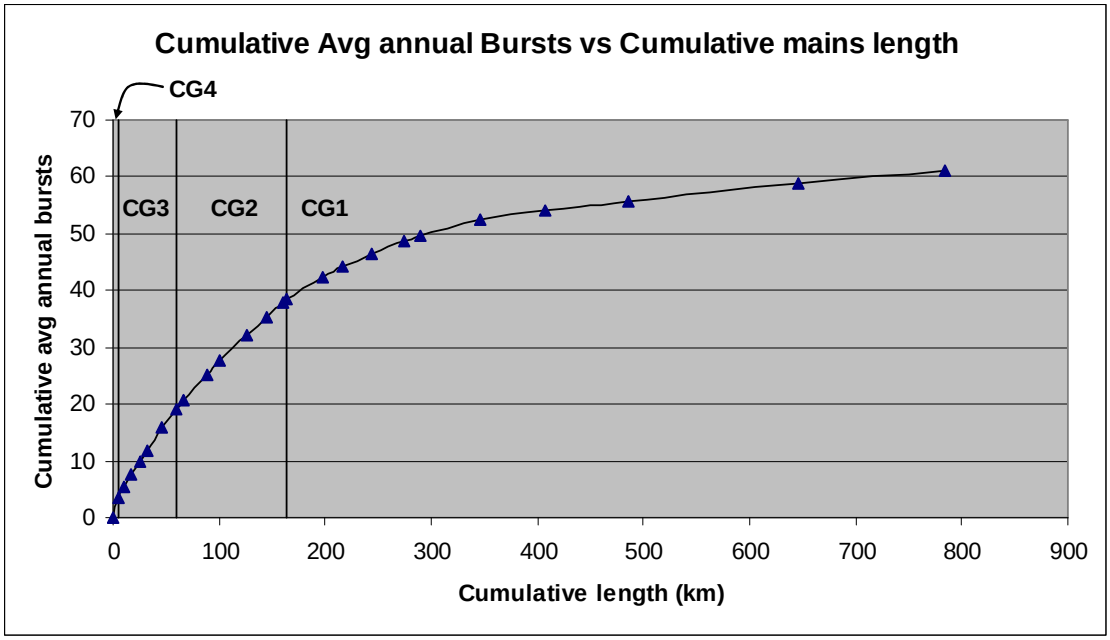
2.1.1 Raw and potable trunk mains

Raw and potable trunk mains have been designated as such, according to the purpose of the main, rather than the size and has been given the prefix TR or TP accordingly. In accordance with the principles of the Common Framework a burst prediction model and renewal model have been developed on behalf of the Group using data collected from the Group companies. This has resulted in a model using a substantial database of burst history calibrated by more than 3,700 pipe section samples. Samples include a large proportion of randomly selected sectional samples. Geospatial analysis has been used to combine soil type, pipe material and pipe age data to predict the pipe condition, likelihood of failure and consequence of failure.

The outputs of the models have been collated into the required formats by Faber Maunsell providing the condition grade summary and burst prediction data.

Cohort analysis carried out by Faber Maunsell is summarised in the table and graph below

Grade	Cohort	Length	Bursts 5yr tot	Annual avg rate	Cum. Burst Rate	Cum. length
4	Rem_D451	5258	18	0.685	0.685	5.3
3	25//	4779	9	0.377	1.061	10.0
	D451CLA	6990	11	0.315	1.376	17.0
	D452	7985	12	0.301	1.677	25.0
	2431	6646	9	0.271	1.947	31.7
	D242ROA	15076	20	0.265	2.213	46.7
	D3//	13263	17	0.256	2.469	60.0
2	D444	6410	7	0.218	2.688	66.4
	Rem_24	22371	23	0.206	2.893	88.8
	D1//	12294	12	0.195	3.088	101.1
	Rem_D2	24663	22	0.178	3.267	125.7
	23//	18729	16	0.171	3.438	144.5
	Rem_243	16603	14	0.169	3.606	161.1
	Rem_2233	2894	2	0.138	3.744	164.0
1	2234	33265	19	0.114	3.859	197.2
	2233CLA	19458	10	0.103	3.961	216.7
	2434CLA	27645	12	0.087	4.048	244.3
	Rem_22	30008	10	0.067	4.115	274.3
	Rem_D	15711	5	0.064	4.179	290.1
	1///	56016	15	0.054	4.232	346.1
	Rem_C4	60973	8	0.026	4.258	407.0
	C45/	79061	8	0.020	4.279	486.1
	Rem_C	159706	16	0.020	4.299	645.8
	Rem_NS	138006	10	0.014	4.313	783.8



2.1.2 Distribution mains

The Company's burst prediction model and renewals model were used to forecast the activity level required to maintain stable performance and avoid deterioration, and also provided information on the condition grading of the distribution mains. The GMEA calculation was based on the unit cost for pipe laid in defined ground surfaces and at standard diameters. The overall valuation of all the mains was then apportioned across the Bands and condition grades in accordance with the guidance.

2.1.3 Communication pipes

The Company's communication pipe study was brought up to date with regard to asset stock and assessment of existing and likely future condition and performance. The Company has circa 6,600 copper communication pipes remaining which were laid for a period of years starting circa 40 years ago when the quality of copper available was inferior (below the normal standard required for below ground use). These "inferior" copper communication pipes have a disproportionately high failure/leakage rate due to pin-holing, similarly there are approximately 4,000 black polyethylene pipes which are known to be prone to brittle fracture.

The resulting programmes of work have been based on the outputs of these predictive modelling techniques and have been developed with the aim of maintaining serviceability in accordance with the principles of the Common Framework namely historic analysis, forward looking analysis and validation. Local knowledge has been used to develop the model predictions into schemes which will resolve known problem sections of main or material types.

The Company is aware that there are approximately 14,000 lead communication pipes. Currently there is no quality programme plan to replace these and the number replaced due to sample failure or customer initiated supply pipe replacement remain low.

2.2 Non-infrastructure assets

Most of the Company's above ground assets were constructed or refurbished during AMP1. These assets are generally in good condition and performing satisfactorily. There is a significant value of shorter life mechanical/electrical/ICA equipment associated with these sites, which requires like for like component replacement to maintain performance in future.

The Company developed a treated water storage strategy during AMP1 and has pursued this with additional/replacement storage at Horsley Cross and Elmstead Market during AMP1. Substitution of improved mains capacity and the de-commissioning of storage in Wivenhoe during AMP2. Replacement of Brightlingsea water tower with a service reservoir and pumping station during AMP3 and replacement of 3 service reservoirs and pumping stations during AMP4 with 2 replacements at East and West Clacton that were brought into service in April and May 2008. The strategy includes the replacement of the existing service reservoir and pumping station at Dovercourt during AMP5. Due to the near completion of East and West Clacton reservoirs and pumping stations 95% of their GMEA was included at a condition grade of 1. Park Road and Frinton reservoirs and pumping station were decommissioned.

Expenditure on maintenance has been targeted to keep assets in a condition which will ensure stable performance. As a small company with few assets expenditure is inevitably "lumpy" and results in some step changes.

3 Table Commentaries

3.1 Table C3.1 – Asset Inventory

3.1.1 Group 1 – Water resources

A1 – Dams and impounding reservoirs.
GMEAv has increased slightly as a result of the recategorisation of Dam assets at Ardliegh which had previously been categorized as treatment works assets. This has lead to a small change in the proportion of asset value assigned to condition grades.

A2 – Raw water aqueducts.
No Change.

3.1.2 Group 2 – Water treatment works

B8 – W3 Treatment works
Horsley Cross treatments works falls into this category. There has been an increase in the GMEAv of this works which is largely due to the Iron Removal plant value which has changed as a result of the update of the unit cost model values. Other assets on the site such as the service reservoir and booster pumping station are confirmed as being correctly assigned.

B9 – W4 Treatment works
Ardleigh TW falls into this category. This is a shared resource with Anglian Water, the value of the assets being split 50/50 between the two companies. During the review it was noted that some of the Intake pumping assets, the service reservoir and some of the Booster pumping assets were incorrectly assigned to the treatment works. Further issues with the balancing calculation were identified and corrected. The result has been a dramatic reduction in the W4 asset GMEAv with the difference being spread across a number of asset groups. As a consequence of this there has been a slight change to the condition grade proportions.

3.1.3 Group 3 – Water Storage

C12 – Service reservoirs.
The overall GMEAv for service reservoirs has increased due to the re-categorisation of Ardleigh SR and the addition of East & West Clacton service reservoirs. The reservoirs at Park Road and Frinton have been decommissioned since PR04 so their value has been removed. The proportion of value with a condition grade of 1 has increased due to the new reservoirs with a reduction in the proportions and CG 4 & 5.

C13 – Water towers.
No change.

3.1.4 Group 4 – Pumping stations

D16 – Intake pumping.
There has been a slight increase in GMEAv due to the re-categorisation of pumping assets at Ardleigh.

D17 – Source pumping.
This line remains broadly unchanged.

D18 – Booster pumping.
During the review it was noted that there had been an error in the GMEAv entered on this line. The correct value has now been used. There has been an increase in the value of booster pumping assets due to the addition of East & West Clacton booster pumping stations which has also increased the proportional allocation to CG 1.

3.1.5 Group 5 – Water Mains

E21 – E25.
All of the line in this group have changed slightly as a result of the review. They now accurately reflect current unit costs, lengths and numbers of the assets.

3.1.6 Group 6 – Management and general.

F28 – F33
The GMEAv and Condition grade for these assets have remained broadly consistent through the review process.

3.2 Table C3.1a – Condition grading based on mains length.

The values entered in this table are as a result of the Cohort analysis carried out on behalf of the Company by Faber Maunsell. The reconciliation of mains length in this table with that in table C3.1 shows a slight discrepancy of 8km, this is not regarded as material.

C4 SUPPLY/DEMAND APPRAISAL

Contents

1 Draft Water Resources Management Plan

The company confirms that this submission is broadly compatible with the latest draft WRMP submitted to DEFRA with the Statement of Response (SoR) and copied to Ofwat in January 2009. A discrepancy between property and population numbers between mid year and year end 2007-08 was revealed while preparing this submission. The demand forecast has been corrected to use mid year values throughout and a revised draft WRMP dated March 2009 is enclosed with this submission. Copies have also been forwarded to DEFRA and the Environment Agency.

The Company is small and has a highly integrated distribution system such that water from either of the two treatment works can be distributed to all parts of the network. The Company is therefore one resource zone for water resources and leakage economics.

2 Economic leakage appraisal

2.1 Summary

Company leakage at circa 70 l/p/d is the lowest in the UK water industry and circa 50% of the industry average. While customers and The Company believe it is important to prevent leakage from rising, future leakage reduction is expected to be driven by reductions in supply pipe leakage associated with increased metering.

As leakage levels are very low the scope for further substantial reduction avoiding excessive cost is correspondingly limited. Background levels of leakage are a high proportion of total leakage with increasing expenditure on active leakage control activity producing very small reductions in leakage.

The Company's sustainable economic level of leakage (SELL) has been derived with assistance from WRc with the latest report dated March 2009 a copy of which is enclosed with this submission. The latest SELL assessment at 5.7 Ml/d is almost unchanged from the previous ELL assessment dated June 2007 at 5.8 Ml/d.

The company's current and proposed leakage targets to 2024/25 are:

2005-10 Total Leakage Ml/d	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**
Target	5.1	5.1	5.1	5.1	5.1
Reported	5.06	5.05	5.04		
20010-25 Total Leakage Ml/d	**10/11**	**11/12**	**12/13**	**13/14**	**14/15-24/25**
Proposed Target	5.1	5.1	5.1	5.1	5.0

3 Current water balance and estimate of leakage

3.1 Potable Water

The overall analysis of the potable water balance for 2007-08 is shown below (2006-07 values shown in brackets). The line numbers refer to June Return Table 10.

<table>
<tr><td colspan="8">Distribution Input (line 26)

29.17 Ml/d

(29.86 Ml/d)</td></tr>
<tr><td colspan="2">Distribution system
◄-------</td><td colspan="6">Customers' installations
-------►</td></tr>
<tr><td colspan="2" rowspan="3"></td><td>Water Delivered – billed measured households
(line 1)
10.15 Ml/d
(10.05 Ml/d)</td><td>Water Delivered – billed measured non-households
(line 2)
6.30 Ml/d
6.39 Ml/d)</td><td>Water Delivered – billed unmeasured households
(line 4)
8.10 Ml/d
(8.89 Ml/d)</td><td>Water Delivered – billed unmeasured non-households
(line 5)
0.00 Ml/d
(0.01 Ml/d)</td><td>Water taken legally unbilled
(line 17)
0.01 Ml/d
(0.01 Ml/d)</td><td>Water taken illegally unbilled
(line 18)
0.00 Ml/d
(0.00 Ml/d)</td></tr>
<tr><td colspan="2">Water Delivered – billed measured
(line 3)
16.45 Ml/d
(16.44 Ml/d)</td><td colspan="2">Water Delivered – billed unmeasured
(line 6)
8.10 Ml/d
(8.90 Ml/d)</td><td colspan="2" rowspan="2">Water taken unbilled
(line 19)
0.01 Ml/d
(0.01 Ml/d)</td></tr>
<tr><td colspan="4">Water Delivered – billed
24.55 Ml/d
(25.34 Ml/d)</td></tr>
<tr><td colspan="2">Water not delivered</td><td colspan="6">Water Delivered to customers (line 20)
24.56 Ml/d
(25.35 Ml/d)</td></tr>
<tr><td rowspan="2">Distribution system operational use
(line 16)
0.10 Ml/d
(0.02 Ml/d)</td><td>Distribution Losses
(line 24)
4.51 Ml/d
(4.49 Ml/d)</td><td>Underground supply pipe losses
0.53Ml/d
(0.58 Ml/d)</td><td colspan="2">Total plumbing losses</td><td rowspan="2">Customer use
24.03 Ml/d
(25.18 Ml/d)</td><td colspan="2" rowspan="2"></td></tr>
<tr><td>Above ground supply pipe losses</td><td>Internal plumbing losses</td></tr>
<tr><td></td><td colspan="2">Total leakage
(line 25)
5.04 Ml/d
(5.05 Ml/d)</td><td colspan="3">Consumption</td><td colspan="2"></td></tr>
</table>

The main components of the potable water balance and how they are estimated in descending order of magnitude are;

3.2 Distribution input

This is the total amount of potable water entering distribution and is the sum of 4 "magflo" meters. The Distribution input (DI) from the groundwater treatment works amounts to circa 80% of total DI and is recorded by a meter which gives agreement to within 1% when drop tested by stopping all boreholes, ceasing forward flow from the treatment works and measuring the drop in the treated water storage tank over several hours and thousands of cubic metres.

The main surface water supply enters the distribution system via a service reservoir with good agreement of the amount leaving treated water storage and the service reservoir inlet. The service reservoir has two outlet magflo meters that are individually drop tested against the storage tank and together make up circa 18% of the total DI.

The balance of circa 2% of total DI is surface water directly fed to one distribution zone. As tank drop testing is not available there is a second check magflo meter in series with the DI meter with excellent agreement between the two.

3.3 Water delivered

3.3.1 Measured

The main components of water delivered are measured household and non household volumes derived from meter readings recorded on the Company's billing system. The household and non household billed volumes are adjusted for meter under registration using consistent estimates of 3% and 4.5% respectively. Measured water delivered makes up circa 56% of DI. Measured property supply pipe losses are only circa 0.3% of DI as the vast majority of meters are fitted externally and used to monitor supply pipe losses.

3.3.2 Unmeasured

This volume is derived as the remainder of the overall water balance and amounts to circa 28% of DI. Unmeasured water is predominantly supplied to households as almost all non households are measured. Supply pipe losses are estimated at circa 2% of DI based on 20 l/p/d which has been used consistently over many years. The estimate for unbilled unmeasured water delivered is negligible, have been applied consistently and amount to circa 0.03% of DI.

3.4 Water not delivered

Water not delivered is dominated by distribution losses and is arrived at by deducting supply pipe losses from the estimate of total leakage.

3.5 Total leakage

Total leakage is estimated continuously by telemetry and verified by whole company minimum night flow (MNF) tests carried out on 3 or 4 nights during the year avoiding the summer months during which night flows are less stable. During the MNF tests all storage tanks are by-passed and the DI is provided from the final groundwater TW meter which is known to be highly accurate from tank drop tests. During the MNF tests the twenty or so commercial customers that from experience may have significant night

usage are logged. A standard allowance of 2 l/p/hr is used for all other connected property legitimate night use which is the weighted average of 8 l/p/hr for the commercial properties and 1.7 l/p/hr for household properties. Although estimates these values have been used consistently for many years. The results of the tests are used to derive total leakage and the overall result is the weighted average for the year. Where there are periods of significant short duration leakage these are corrected for using telemetry records or on site estimates. These corrections are used in both directions as appropriate and have little effect on the total for the year. Total leakage is circa 17% of DI of which circa 15% is distribution losses. The company hour – day factor is 24 as mean zonal night pressures are equal to the day pressure. The effect of flow related pressure control decreasing downstream night pressures in centre's of demand balances the overnight rise in pressure on the upstream sections of the distribution network.

Distribution system operational use is estimated in a normal year at circa 0.07% of DI but for 2007-08 was higher than normal at circa 0.3% of DI due to the testing and commissioning of replacement service reservoirs to the east and west of Clacton on Sea.

3.5.1 Leakage from service reservoirs and water towers

Leakage from service reservoirs and one water tower is estimated as zero. The integrity of the potable water storage tanks is checked during the MNF tests described above with no drop in level occurring during several hours when the tanks are by-passed. There is also good agreement between the inlet and outlet flow meters at all storage sites. The one water tower is visually inspected and free of leaks.

3.5.2 Potable trunk main leakage

The delivery of water from the surface water treatment works to the distribution system service reservoir is continuously monitored by telemetry with good agreement between the meters. All other potable trunk main leakage is part of and cannot be distinguished from distribution losses. Most trunk mains run through a central rural area before passing through bulk meters near centres of population. The average leakage in the rural area expressed as l/p/d is about equal to the average for the whole company despite the greater than average ratio of trunk mains. This provides a method of indirectly checking background trunk main leakage deterioration with any substantial step change in losses able to be seen on the telemetry system trends.

3.5.3 Distribution system leakage

Based on many years experience most distribution system leakage is known to occur at connections and from service pipes. Some mains when repaired show evidence of leakage over a sustained period but these are only a small proportion of the total. Some years ago an intensive active leakage control exercise using hired in teams did not find any significant amount of leakage from mains. Although disappointing this result was expected as most significant leakage is reported with very few substantial leaks unreported for significant periods of time.

3.5.4 Supply pipe leakage policy

The Company operates a fee repair policy for customer supply pipe leakage and in many cases will replace supply pipes free of charge. The policy is effective at shortening the

average run time of supply pipe leaks and has been applied to an average of circa 100 free repairs/replacements from 2002-03 to 2007-08. The estimated water saved is 60 l/p/d averaged over the year which using a marginal cost of 4 p/m3 equates to circa £0.88 for a cost of circa £450 in 07-08. Despite being unjustifiable on economic grounds the Company is keen to continue to provide the free service provided the costs of doing so are allowed in base opex.

3.5.5 Untreated water

Raw water trunk main leakage is estimated as zero. All borehole source water is transferred to one treatment works where it overflows a surge protection chamber before entering the filtration plant. During potentially high electricity demand and transmission cost "triad" warning periods all borehole sources are stopped. The surge chamber is the highest point on the raw water transmission system and the level in the surge chamber, which is monitored by telemetry stabilises during each period when pumping is stopped. This confirms the integrity of the raw water trunk mains and borehole source isolation. There is also good agreement between meters recording raw water leaving the sources, entering/leaving treatment and entering/leaving treated water storage, the latter meter is the distribution input (DI).

4 Baseline leakage strategy

4.1 District Metering

The Company has a well established and comprehensive bulk meter (BM) and district meter (DM) system covering all properties. The Ardleigh-Dedham BM is also the DM with all other BMs having DMs downsteam. There are a total of 31 DM areas with an average size of 2,340 properties. This includes the large Clacton DM area which represents 34.8% of the total number of properties supplied. Although the Clacton DM area is large its MNF (l/prop/hr) is similar to the smaller DM areas. Excluding Clacton which is to be sub-divided in future, the average size of DM areas is 1,576 properties. 71% properties are supplied by DMs covered by telemetry with daily examination of MNF.

Further development of DM areas is now possible following the commissioning of replacement service reservoirs and pumping stations to the east and west of Clacton-on-Sea in April and May 2008. One old service reservoir and pumping station in Frinton-on-Sea was taken out of service during June 2008 and the one remaining old service reservoir and pumping station in Clacton-on-Sea will be taken out of service during April 2009.

There are metered sub-zones within DM areas and when the billing system is next upgraded the option of having all charging meters including households cross-referenced to the nearest upstream sub-zone and DM will be considered. Assuming this is feasible and affordable the understanding of the water balance and leakage estimation will be considerably improved. The Company also intends to install fixed network AMR within Clacton-on-Sea which will improve the detection of supply pipe leakage and shorten burst run times.

The Company invested in improved leakage reporting systems during 2008-09 and is investigating the best options to provide additional DM areas in Clacton for implementation to commence in 2009-10.

4.2 Active leakage control (ALC)

As most significant and detectable leaks are reported, most ALC is focused on pinpointing reported leaks rather than routine surveys. MNF is regularly checked for all DMs on telemetry and logged where overall consumption shows an increase with no obvious cause. Increased MNF will trigger survey investigation with greater scrutiny of any within zone meters and "Soundsens" logger surveys. Leakage is pinpointed using leak noise correlation and/or sounding.

The equivalent of one FTE is used on ALC work. No contract teams are routinely employed on ALC although this was done with only limited success several years ago. Expenditure on leakage control excluding repair costs is approximately £100 k/annum. Leak repair costs are approximately £260 k/annum.

4.3 SELL Methodology and leakage/cost relationship

The ELL assessment methodology and the current leakage/cost relationship are described and shown in the March 2009 WRc report enclosed with this submission. The WRc report also provides details on all options considered and sensitivity testing.

5 Options to reduce leakage

Pressure management

Pressure management was greatly extended during 1990 - 95, motivated primarily by the need to improve levels of service for supply interruptions (DG3) some of which affected the same customers repeatedly. This was successful at reducing bursts and pressure, which remains above 15m at all points at all times. Pressure control is so closely managed that the average daytime pressure is equal to the average night pressure at only 25m

The improved pressure management helped to sustain low leakage levels and reduce interruptions due to bursts during a period when the capital programme was dominated by water quality compliance issues. There is however limited scope for further development either by extending the area or by lowering pressures further. The commissioning of two new service reservoirs and pumping stations to the east and west of Clacton-on-Sea has provided some local opportunities for further average pressure reduction on part of the rural network. As the new sites are further from the urban areas they supply there is a small increase in average pressures downstream such that the average pressure overall will be sensibly unchanged despite the local improvements in rural areas.

Infrastructure renewal

Infrastructure renewal is essential to prevent leakage from rising and is included in the Company's base service infrastructure plans and described in section B5 with particular reference to leakage from "inferior" copper communication pipes. The Company does

however consider that it would be wholly uneconomic to drive leakage further below the sustainable economic level by increasing infrastructure renewal beyond that needed to maintain stable serviceability.

The Company will continue to monitor improvements in ALC technology and adopt these when their effectiveness is proven. The Company introduced the "Soundsens" noise logging and correlation system during 2007 which combines noise logging and correlation to locate and pin-point leaks. "Permalog" noise loggers are also used but less frequently since the introduction of "Soundsens". There is a need for better methods of detection for non metallic pipes and especially for trunk mains where existing methods are either ineffective, difficult to operate and/or too costly for other than specialist applications. An acoustic logging trunk main survey has been employed previously using hired in services without any leaks being found. Examples of techniques that have been considered but not pursued due to cost, operational risk, or both are aerial photography using thermal imaging cameras and "SAHARA" internal acoustic logging. When opportunities arise in conjunction with other work facilities will be provided to monitor long sections of trunk mains for leakage. When checks show significant leakage these will be followed up by sounding an d if necessary SAHARA surveys to pinpoint the leaks for repair. SAHARA is a WRc system and trademark.

6 Environmental and social cost benefits

The SELL assessment is based on short run marginal cost with an allowance for the environmental and social costs of leakage. The Environment Agency have stated that none of the Company's sources are subject to sustainability or Habitats Directive review of consent reductions. The environmental and social cost component is therefore relatively low, is dominated by an allowance for carbon and adds circa 10% to the marginal cost of energy and chemicals. The marginal cost used for the latest analysis is 4.1p/m3 but sensitivity testing shows that the marginal cost would have to exceed 7.5 p/m3 before the SELL decreased to the current level.

7 Leakage summary and targets

The March 2009 WRc report concludes that the current target of 5.1 Ml/d is appropriate until beyond the current planning horizon. The Company has incorporated accelerated household metering and partial fixed network AMR into the latest draft WRMP and this submission with a forecast reduction in supply pipe losses and the potential for shorter run times for those supplies covered by the fixed network AMR. Further DMs in Clacton on Sea and improved reporting systems should also assist leakage control efficiency. The Company total leakage target has therefore been reduced from 5.1 Ml/d to 5.0 Ml/d from 2014-15 with the lower value maintained despite an increasing customer base to beyond 2025.

2005-10 Total Leakage Ml/d	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**
Target	5.1	5.1	5.1	5.1	5.1
Reported	5.06	5.05	5.04		
20010-25 Total Leakage Ml/d	**10/11**	**11/12**	**12/13**	**13/14**	**14/15-24/25**
Proposed Target	5.1	5.1	5.1	5.1	5.0

8 Economics of metering

The Company strategy with respect to metering is explained in Part B5 Section 2.1. The strategy has been split between "selective" and "optional" metering but does not align precisely with Ofwat definitions. The "selective" label has been used to distinguish the meters to be fitted pro-actively as opposed to optional meters that are fitted reactively. The selective meters will be used to provide comparative bills, following which customers will then choose measured charges and they are consequently more akin to planned meter options and greatly reduce the actual number of reactive meter options provided for. The installation of meters on a planned rather than reactive basis is much more efficient and a cost saving of 25% has been assumed.

For those customers that have meters fitted selectively but do not opt for measured charges the property will become measured at the next change of hands. This is consistent with the treatment of meter optants who subsequently revert to unmeasured charges.

We support the objectives within the Environment Agency's recent report "Water for people and the Environment", March 2009, that includes water companies implementing near-universal metering of households, starting in areas of serious water stress. Particularly as we are located in the most water stressed region of the country.

Having achieved 68% household meter penetration by 2008, the Company now considers the time is right to move to near universal metering over the AMP5 period in support of its water efficiency strategy and using more cost effective planned rather than reactive installation.

In addition to the cost savings on installation the planned programme will have additional benefits for the condition and serviceability of stop cocks and provide an opportunity to pro-actively replace communication pipes where this will produce further benefits in leakage reduction and/or water quality compliance.

DEFRA's Water Strategy 2008 states that "*The current system of charging for water, based on rateable values from the 1970s is increasingly indefensible, particularly in water stressed areas*".

The Company agrees with the DEFRA statement and intends to introduce an assessed charge for all unmeasured customers once meter penetration reaches 80%. This will link customer bills to consumption and make the rateable value basis for charging redundant. As the company already manages an assessed charging mechanism, for customers who request a meter but cannot have one fitted, we will review how this may be extended to all unmeasured customers. This will also help us publicise a water efficient focus to our consumers.

The Company may at some future date seek to impose measured charges on the remaining unmeasured customers after providing a period of notice and comparative billing but should this be considered appropriate it is not expected to occur before 2015.

Database C5-1, Part C5 – Proposed work programmes Water Quality and other projects

Commentary by COMPANY

1 Overview

The water quality and other projects database contains all capex forecast for the AMP5 period. Anticipated expenditure for AMP6 has been included for capital maintenance work. Actual and forecast costs for the remainder of the AMP4 period are also included.

The planned expenditure agrees with the table entries as listed in the reporting requirements. This is as follows:

Capital maintenance infrastructure.

Table -	B3.5 Line 4 AMP5 total -	£7.350m
Database -	TH01 Communication pipe renewal -	£2.745m
	TH02 Distribution mains renewal -	£2.450m
	TH04 Trunk mains renewal -	£1.955m
	TH08 Raw water trunk main renewal -	£0.200m
	Total -	**£7.350m**

There is no proportional allocation of investment in this area and the totals reconcile.

Capital maintenance non-infrastructure.

'SECTION REMOVED AND REPORTED IN PR09 EXCISION DOCUMENT'

There is no proportional allocation of investment in this area and the totals reconcile.

Enhanced service levels infrastructure.

Table - B6.3 Line 7 – No infrastructure schemes identified

Database - No infrastructure schemes identified.

There is no proportional allocation of investment in this area and the totals reconcile.

Enhanced service levels non-infrastructure.

Table - B6.3 Line 10 AMP5 total - £1.015m

Database - No non-infrastructure schemes identified.

31% of the investment for scheme TH13 AMR & metering programme identified for Supply/Demand balance has been proportionally allocated to Enhanced service levels within the database. The proportion of the overall scheme allocated to Enhanced service level will provide a much improved service to customers by using a fixed network to automatically read 21,500 meters in the Clacton area on a daily basis providing hourly reading. Although the cost of the AMR part of the scheme could be separated from the rest the benefits are only realized as part of the whole scheme so the cost benefits could not be broken down into it's component parts. The allocation of the AMR to Enhanced service level is as a result of advice from Ofwat.

Considering both SDB and ESL together the totals reconcile.

Supply/demand balance infrastructure.

Table - B5.2 Line 11 AMP5 total - £0.750m

Database - TH09 Distribution mains - £0.750m

There is no proportional allocation of investment in this area and the totals reconcile.

Supply/demand balance non-infrastructure.

Table - B5.2 Line 21 AMP5 total - £2.295m

Database - TH13 AMR & Metering programme - £3.290m

69% of the investment for scheme TH13 has been proportionally allocated to SDB the remaining 31% allocated to ESL as described above.

Considering both SDB and ESL together the totals reconcile.

Quality Enhancement infrastructure.

Table - B4.3 Line 16 – No Infrastructure schemes identified

Database - No Infrastructure schemes identified.

There is no proportional allocation of investment in this area and the totals reconcile.

Quality Enhancement non-infrastructure.

Table - B4.3 Line 6 AMP5 total - £0.210m

Database - TH20 SEMD at borehole sites - £0.210m

There is no proportional allocation of investment in this area and the totals reconcile.

2 Projects

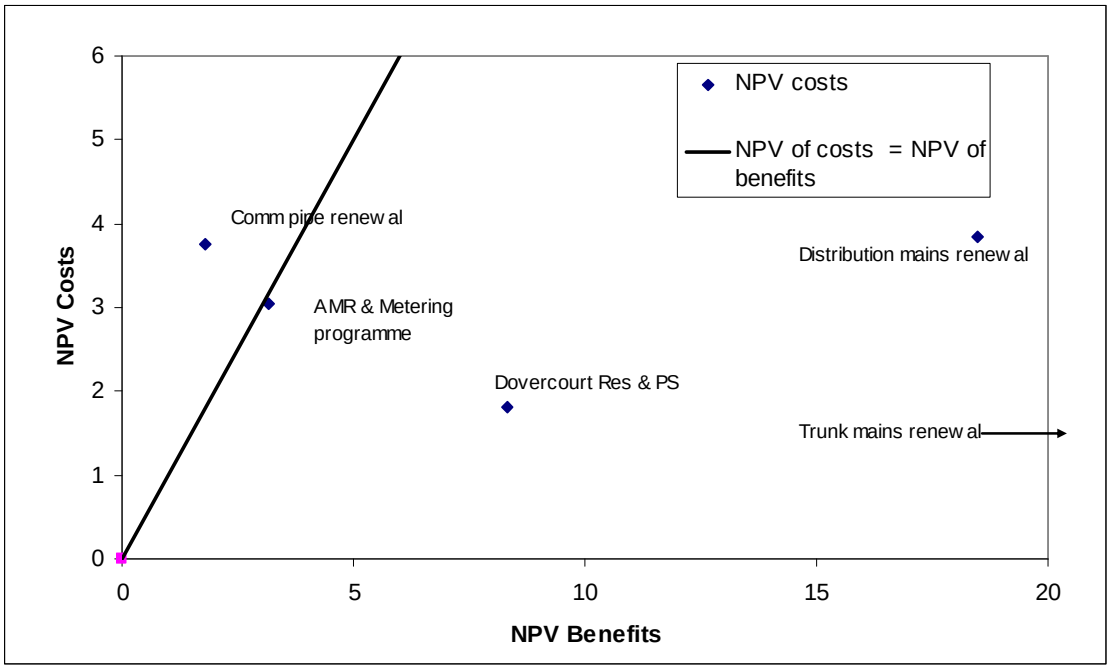
All projects have been included in the Project database and have been correctly allocated to their cost driver. Proportional allocation has been used to allocate 69% of the Capex for TH13 AMR and Metering programme to SDB and 31% to ESL.

All individual projects have been included and aggregated projects of small similar schemes have been included. Smaller schemes of less than £0.500m have been included in the database for completeness and are made up of aggregated very small schemes.

It was not possible to carry out CBA on the aggregated schemes as determining the benefits would not be feasible. With the exception of the Quality Enhancement allocation for SEMD at the Borehole sites the schemes have resulted from the bottom up approach to Capital Maintenance using the asset revaluation exercise to identify the likely area for refurbishment and component replacement across the whole asset base. The review also included analysis carried out by the Group IT department to identify the requirement to replace IT Hardware and Software due to systems being no longer supported or compatible with other systems. Mobile plant and machinery, vehicles, new development mains and building repairs are collated into aggregated schemes and included in the database. Identifying benefits where there is a requirement to keep the company operational would not be practical although overall this does equate to 34% of the capital programme.

Expenditure entered for AMP4 was identified in the AMP4 submission and formed the AMP4 business plan. The figures are taken from the current forecast for capital expenditure which is regularly reviewed to ensure accuracy.

Graphical representation of costs and benefits:



3 Scorecards

These have been completed for ten of the projects in the database, a summary table of AMP5 data follows:

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4 Cost Benefits/Emissions

Five of the projects contain entries under these headings. These are:

- TH01 (communication pipes)
- TH02 (distribution mains renewals)
- TH04 (potable trunk main replacements) which for CBA was done as four separate projects but has been aggregated in the projects database
- TH07 (Dovercourt reservoir and pumping station)
- TH13 (AMR & metering programme).

TH01 includes all communication pipe replacement anticipated during AMP5, but the CBA was only carried out on the proactive replacement of inferior copper and black polyethylene pipes.

5 Changes to project database from draft

For every project there has been a review of the costs entered.

The AMP4 forecast has been updated to reflect expected outturn costs. The AMP5 forecast has been changed to reflect the revised efficiency assumptions. This includes a change in assumption of future costs as a result of input price inflation which is described in Section B2 and Section B11.

Capex requirements for each project have been reviewed and changed to reflect the Company's commitment to managing the balance of risk and investment.

The CBA scoring mechanism and values were reviewed and updated following revisions to the Willingness-to-Pay values which have now been entered. These are set out in Section C8 under the CBA commentary. In summary, a review was carried out between draft and final business plans to ensure there was still a high degree of confidence that the correct WtP values were being used. The conclusion for THWS was that the value for reducing supply interruptions was too high particularly when compared to values obtained from other companies and we have consequently reduced the benefit scores derived where this OPM had been used.

The scorecard for each project has been reviewed in the light of the continued commitment from the management team and the greater understanding of the costs, benefits and risks.

TH01 – Communication pipe replacements.

Capex, NPV costs and benefits have been changed. The scorecard review increased the score to 82.5% by increasing the decision making score from 2 to 3 as a result of improved understanding of the synergies between different projects and how, by careful

planning, efficiencies can be achieved (comm pipe replacement in conjunction with distribution main replacement and meter replacement).

TH02 – Distribution mains renewal.

Capex, NPV costs and benefits have been changed. The scorecard review increased the score to 85%, performance defined and programming score both increased from 2 to 3. The sections of mains due for replacement have been built up into proposed schemes enabling synergies to be identified.

TH04 Potable trunk main renewals.

Capex, NPV costs and benefits have been changed. The scorecard review increased the score to 85%, performance defined and programming score both increased from 2 to 3. The sections of mains due for replacement have been built up into proposed schemes enabling synergies to be identified.

TH07 – Dovercourt new Res and PS.

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TH08 – Raw water trunk mains renewals.

Capex has been changed. There has been no scorecard completed as the level of investment identified is sufficient to cover only minor replacements of valves and small sections of main which will fail during the period.

TH09 – New developments mains.

Capex has been changed. No scorecard has been completed.

TH10 – Refurbishment of buildings.

Capex has been changed. No scorecard has been completed.

TH12 – Optional metering.

This has been removed as a single entry and has been incorporated into TH13 – AMR & metering programme.

TH13 – AMR and metering programme.

A thorough review of this area has been carried out which is reflected in the changes in Capex, NPV costs and benefits and the scorecard result. The CBA now includes AMR and is slightly cost beneficial. Further detail can be found in the B3 commentary. The scorecard result has increased as a result of the greater confidence in the detail of the programme. Large reductions in installation cost for meters and cost have been determined as feasible due to the synergies with this programme and the infrastructure and meter replacement programmes. Decision making and programming has increased from 2 to 3 giving a score of 87.5%. The component parts of the programme have been proportionally allocated to the correct areas with the AMR component being allocated to ESL on the advice of Ofwat even though it had previously been moved to SDB at Draft.

TH15 – IT, telemetry and AMP work.

This has undergone a thorough review between draft and final and the capex has changed as a result. No CBA has been carried out due to the type of work which is predominantly replacement of existing due to old legacy systems not being supported or compatible. The scorecard result has increased to 82.5% to reflect the commitment to the proposed work programme and the level of challenge applied which has reduced the required investment.

TH16 – M&E component replacements.

Capex has been changed, the level of investment is derived from the outputs of the Asset Revaluation exercise and is broadly consistent with investment during AMP4. No CBA has been completed as the investment covers the replacement of a number of small value components which individually would have only a small impact but must be replaced on failure to maintain serviceability levels. The scorecard result has been increased to 82.5% after increasing the decision making, programming and needs challenged scores from 2 to 3.

TH17 – Meter replacement.

Capex has been changed. The actual detail of the replacement programme remains unchanged from draft but has been confirmed as a necessary part of the metering strategy. The replacement programme interfaces with the AMR and metering programme and helps to deliver substantial installation cost reduction. No CBA has been carried out as the benefits of installing the meter have already been realized at the initial installation, replacement is required to maintain the serviceability of the equipment which would rapidly deteriorate if left to operate to failure. The scorecard result has been increased to 87.5% as a result of decision making and needs challenged having been increased from 2 to 3.

TH18 – Miscellaneous plant and machinery.

Capex has been changed. CBA has not been carried out due to the nature of the small value and low impact of the replacements. The scorecard result has increased to 77.5% due to decision making having increased from 2 to 3 to reflect the commitment given to the programme.

TH19 – E & W Clacton Res and PS.

Capex has been changed. No scorecard has been completed.

TH20 – SEMD at borehole sites.

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C7 - TARIFFS AND REVENUE FORECAST Supporting information

OVERVIEW

This section provides the base input to the integrated tariff basket model where the system generated revenue is created and imported into the financial model to determine price limits

The information required by the system includes forecasts for underlying changes in demand, new properties and details of meter switching. This information has been taken from the data used in the Companies Water Resources plan. The detailed customer numbers and consumption information is profiled in table B5.1.

The business plan contains a selective metering programme. The actual numbers associated with the programme are profiled in table C4.1 which also contains the forecast numbers of new connections. These numbers provide the base input for Table C7.1

The tariff plan includes forecasts of charges (standing charges, volumetric rates and rateable value charges). The forecast consumption by different types of customer are derived from the companies demand forecasting model and are consistent with data used in The Water Resources Plan and June returns.

Charges for 2008-09 are in line with the 2008-09 Principle Statement. The company has used it own principle statement model to build up the consumption and rateable value charges and the latest available tariff volume charges for measured consumption. The differential used for 2008/09 is £48 and £49 for 2009/10. This is to correct historical billing issues arising from the measured income accrual error. From 2010/11 onwards the differential will revert to a normal level.

Table C7.1 shows the actual charges and charging base quantities for 2006-7 and 2007-08. The unmeasured household rateable value water total has been calculated by the Company's Water Resources Plan.

In block C row 17 on instruction from Ofwat we have entered a figure of £0.100 to balance the revenue variation caused by the 7% reduction in tariffs in 2007/08 arising from the measured income accrual error.

Table C7.2 divides the Company's large user portfolio into usage groups based on annual consumption. Charges are based on a percentage of the standard rate included in Line 4 of table C7.1.

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No charges are made in respect of unoccupied measured properties.

C8 - SUPPLEMENTARY INFORMATION ON JUSTIFICATION FOR PROPOSED INVESTMENT – INCLUDING OUTCOME OF COST BENEFIT ANALYSIS AND CARBON ACCOUNTING

Commentary by COMPANY

Contents

1 Overview of Cost Benefit Analysis (CBA)

The UKWIR common framework for capital maintenance planning provides companies with the mechanism, via its cost-benefit objective, to justify funding requirements based upon economic arguments, that is, aligning levels of service and serviceability with customers' willingness to pay.

The Company has used CBA to justify planned expenditure where there has been suitable reference to service levels and serviceability that align with the Output Performance Measures (OPM's) included in the calculation tool. The calculation of the Net Present Value (NPV) of costs and benefits is performed using a standardized tool (Solution Manager) developed on behalf of Veolia Water UK (VWUK) by ICS Consulting and uses the Willingness to Pay (WtP) values derived from a stated preference survey carried out on behalf of VWUK by ICF International. Three regulated water companies with the VWUK Group (the Group) jointly participated in this work; Tendring Hundred Water Services (THWS), Folkestone and Dover Water Services (FDWS), Three Valleys Water (TVW).

The WtP survey involved 500 customers from the THWS supply area who were asked a series of choice preference related to the following six service attributes and dependent bill levels. The attributes were divided into two blocks of 3 which were randomly allocated to the respondent with no reference to the customers' concerns.

1.1 Table of service attributes

Label	Descriptor	Unit of measure
	Block A	
INTER	Number of properties with unplanned interruptions to water supply lasting more than 6 hours	100's in 100,000 households affected per year
TSA	Number of properties complaining about unpleasant taste, smell and/or appearance of tap water	100's in 100,000 households complaining per year
HARDN	Number of properties complaining about hardness of tap water	Number in 100,000 households complaining per year
	Block B	
SAVED	Water saved through further water efficiency measures	1000s of additional households
EMISS	Annual greenhouse gas emissions	1000s of additional cars
TESTS	Number of tests of water quality failing to meet standards	Number in 100,000 tests
	Omitted from THWS questionnaire	
PIPES	Hosepipe bans lasting more than three months	Number of hosepipe bans per 100 years
RIVER	River water levels	1 if enhanced service, 0 if no change

The last two attributes (PIPES and RIVER) were omitted from the THWS questionnaire as they were not felt to be applicable; there is no history of hosepipe bans in the THWS supply area and the operation of the Company has no perceived impact on river levels.

The results of the survey ware modelled and tested using standard conditional logit and mixed logit analysis techniques. This enabled the results to be converted into a Willingness to Pay valuation for each of the service attributes.

1.2 Table of WtP estimates

Variable	Improvement	Standard CL			MXL-EC		
		WTP	*95% Conf. Interval*		**WTP**	*95% Conf. Interval*	
			THWS				
INTER	**-0.3**	**£10.38**	*£8.43*	*£12.32*	**£8.46**	*£6.69*	*£10.23*
TSA	**-1.18**	**£14.76**	*£12.54*	*£16.98*	**£11.58**	*£9.48*	*£13.68*
HARDN	**-8**	**£12.67**	*£10.55*	*£14.79*	**£9.79**	*£7.74*	*£11.84*
SAVED	**18**	**£9.60**	*£6.25*	*£12.95*	**£10.99**	*£7.78*	*£14.21*
EMISS	**-3**	**£9.72**	*£7.77*	*£11.67*	**£8.28**	*£6.40*	*£10.15*
TESTS	**-40**	**£12.14**	*£10.56*	*£13.71*	**£12.02**	*£10.05*	*£14.00*

The WtP values were converted into OPM's and developed into the Solution Manager CBA score calculator. Sixteen OPM's were developed which aligned to the above service attributes and to other measures as defined by the Group. Some of the OPM's were not applicable to THWS and have not been used, others were not linked to WtP values. All OPM's had social and environmental damage costs and private costs derived that would result from a service failure for each of the individual companies in the Group. A template was developed specific to each Company so the standard calculations would operate using the company specific valuations.

A review of the template valuation was carried out between draft and final business plans to ensure there was still a high degree of confidence that the correct WtP values were being used. The conclusion for THWS was that the value for reducing supply interruptions was too high particularly when compared to values obtained from other companies. The methodology used to apportion the WtP value across the bands of interruption length was reviewed, the results derived from a mid-point averaging technique reduced the values and therefore reduced the benefit scores derived where this OPM had been used.

Between draft and final an additional OPM, 'Water Saved', was included into Solution Manager. This had been developed for draft alongside the original version as it was noted that customers had expressed a strong preference for reducing the amount of water abstracted from the environment but this had not been included in the analysis. The introduction of this OPM enabled measures taken to assist customers to be more water efficient to be valued as a benefit. It was clear that this attribute was very different to leakage reduction although both reduce the abstraction impact on the environment.

1.3 Table of OPM's

OPM Ref	OPM Description
1	Water Quality (Biological & Chemical)
2	Water Quality (Aesthetic)
3	Water Pressure
4	Supply Interruptions
5	Security of Supply Resources
6	Leakage
7	Sludge disposal
8	Extra Regulatory Reporting
9	Prosecution
10	Personal injury
11	Customer contacts
12	Carbon equivalent emissions
13	Staff productivity
14	Transport disruption
15	Avoided costs to business
16	Water saved

Each of the investment programmes that impacted on service levels that could be quantitatively evaluated was included in the CBA and a solution workbook was filled out. The change in unit of measure for each of the OPM's affected by the programme was derived over a 40 year period and the capital cost and operational cost changes were determined over the same time period. Solution Manager extracted the information from the workbooks and applied the data from the OPM template and the CBA scores were calculated and displayed.

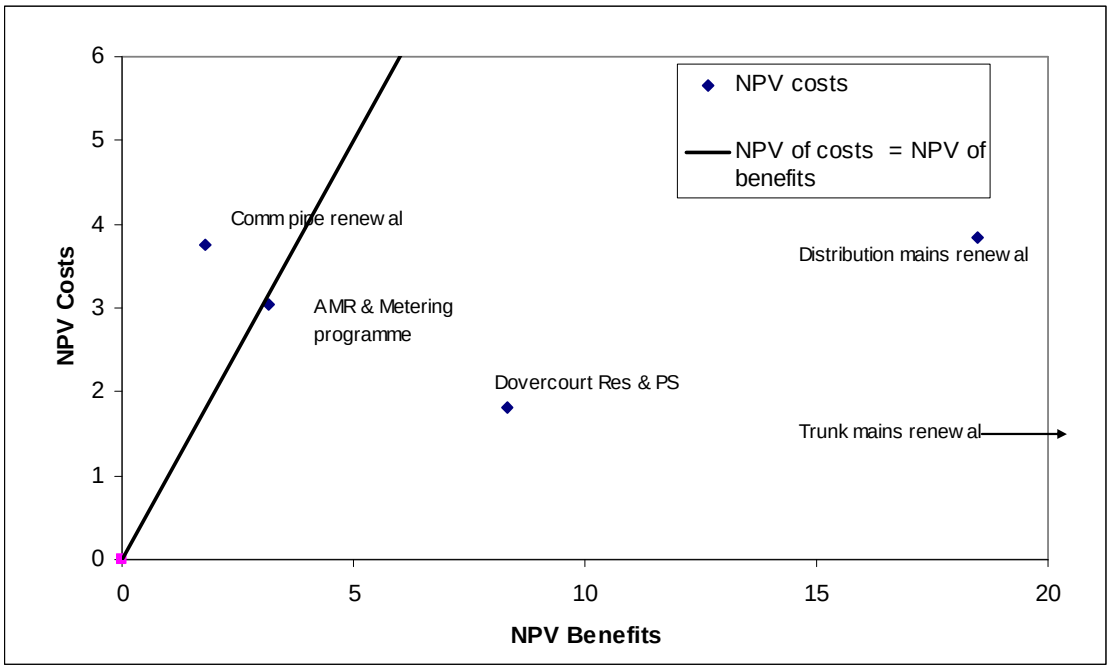
The results for each programme were transferred into table C8.1 as required.

2 Project OPM summary

2.1 Table of scores and OPM's used

'SECTION REMOVED AND REPORTED IN PR09 EXCISION DOCUMENT'

2.2 Graphical representation of costs and benefits:



3 Carbon accounting

Five of the projects contain entries under these headings. These are:

- TH01 (communication pipes)
- TH02 (distribution mains renewals)
- TH04 (potable trunk main replacements) which for CBA was done as four separate projects but has been aggregated in the projects database
- TH07 (Dovercourt reservoir and pumping station)
- TH13 (AMR & metering programme).

Embodied carbon and greenhouse gas emissions were determined by applying the conversion factors from the UKWIR document; 'Carbon accounting in the UK water industry: Guidelines for dealing with 'Embodied Carbon' and whole life carbon accounting' (2008).

The calculations were performed by reviewing the components of the projects that would contribute to carbon and GHG emissions, summing them and then applying the shadow price of carbon for the year of activity. The NPV of the carbon was then determined over a 40 year period.

The change in operational carbon emissions was calculated from the change in power used due to the changes in pumping resulting from the programmes. The net result was a very small overall reduction in operational carbon emissions.

Table C4.1
Forecasts of new connections and metering programme

Commentary by Company

The Company confirms:

The entries are consistent with the draft WRMP demand forecast.

The number of optional and selective meters expected to be fitted to existing properties during AMP5 totals 12,000. The demand forecast also assumes that all meters fitted to unmeasured properties will come into charge immediately as if all were optional meters. In practice 80% of meters are expected to be fitted as part of a planned programme and then be used to generate comparative bills. Customers will be encouraged to opt for measured charges and properties will become measured on change of hands. For most of the programmed meter installations there will be a time lag before coming on charge. It has been assumed that 50% of the selective meters will come on charge in the first year with a further 30% coming on charge in the second year.

The resulting meter penetration by 2015 will be that 90% of households will have a meter installed, 84% of meters will be on charge. By the end of 2018 it is forecast that 90% of household will measured.

Block A – Properties connected during the year

Lines 1 and 2

The entries are consistent with the draft WRMP demand forecast and are based on the average of recent years and figures from the Regional Spatial Strategy (RSS) which has been profiled to reflect the effects of the economic downturn. Consultation with GOEast (Government Office for the East of England) has confirmed no change to the total growth over the planning period of the RSS but agrees there will be a temporary reduction as indicated by the change from the draft figures.

Block B – Metering programme

Lines 3 and 4

The Company intends to install most meters to existing unmeasured households during AMP5 using a planned programme that will be more efficient and reduce installation costs by circa 25%. Once installed, these meters will be used to generate comparative bills. These installations closely resemble optional meters but have been allowed for in line 4 as selective for clarity. The meters do not

however conform to the Ofwat definition as most of them will not come into charge immediately.

The planned programme of meter installation will decrease the number of meters fitted in response to ad-hoc customer requests which have been shown in line 3.

As the total number of meters increases the number of ad-hoc meter option requested will decrease allowing the number of planned installations to increase, as profiled in lines 3 & 4.

Line 5

Company policy is to install meters at the property boundary to maximise leakage savings and ensure easy access for meter reading and maintenance. Meters are fitted internally when requested by customers or where this is the only practicable option not involving excessive cost. In line with the historic average internal meters are only expected to be used for 3.15% of installations.

Lines 6 and 7

Based on the estimated starting position and expected future mains and communication pipe replacements circa 40% of external meters will be fitted in existing boundary boxes with the balance fitted in new boundary boxes.

Line 8

Virtually all non-household properties are now metered and no non-household meters are expected to be fitted with meters in future.

Table C5.1 Commentary
Water Service – logging up / logging down and shortfall reports

Commentary by the Company

There is no logging up or logging down, and no shortfall of expenditure to report for Tendring Hundred Water Services.

Table C5.1 has not been completed.

Table C7.1 Water service – Revenue forecasts

Block A Charging

Line A1 of this section, Total Unmeasured household rateable value – water, can be seen to decline substantially from the period 2006/7 to 2014/15. This is a result of the Company's metering programme which will see around 800 meter optants each year in 2008/9 and 2009/10 and an increased level of around 2,000 optants each year from 2010/11 to 2014/15.

The increased level of meter optants is one of the major projects in our capital program for AMP5 and will see the unmeasured household customer base reduce from 19,650 at the end of 2009/10 to 12,240 at the end of 2014/15, allowing the Company to achieve around 83% metering in charge by the end of AMP5.

Rateable value charges for unmeasured household customers are extracted from the companies billing database and are consistent with the 2007/08 June return.

Block B Charging base

The unmeasured household USPL and measured household USPL are based taken from the Company's water resource plan.

The Measured customer base will grow each year with the number of planned meter optants and the forecast number of new properties. We have assumed a modest number of new property connections over the period of the plan averaging 464 per year. This is in line with our water resources plan and reflects the most accurate information available from our stakeholders during consultation for the plan. The number of internal meters is predicted to grow slowly in line with current levels

The rates for the under registration of household and non-household meters are taken from the Company's water resource plan.

In line with our current billing profile, we have assumed a 15% reduction in consumption for meter switchers.

Block D- Efficient Billing Factor

Line 22 : Connecting and billing a new property

The cost incurred for connecting and billing a new property is calculated to be £9.11

We have priced the following scenario:

- New property has been built. Connection and meter already installed.
- Customer moves into property for first time and calls company to confirm

The cost has been broken down into three stages:

1. Marginal cost of setting up new account; £1.96

We have estimated the average time spent by a contact agent answering the call and setting up the account on the billing system.

2. Marginal cost of billing an additional customer; £1.42

This is based on actual costs quoted by our current external supplier to print and to provide fulfilment services. It includes additional costs of company literature.

3. Read meter; £5.73

Three meter readings will be required. This is based on actual costs from our meter reading team.

Line 23 : Finding and billing a formerly occupied void property

The cost incurred for finding and billing a formerly occupied void property is calculated to be £19.91.

We have calculated this cost for both measured (£18.48) and unmeasured (£22.23) properties and assumed that the ratio of properties will be in proportion to the current meter penetration of 70%.

Measured properties (£18.48)

We have priced the following scenario:

- Assume void properties flagged up by CST on meter round
- CST checks void property for occupancy as part of normal meter walk
- Check by CSA on Land registry for occupier names
- Set up account as if connecting and billing a new property

The cost has been broken down into three stages:

1. Check system for void properties; £5.78

We have assumed cost to be the normal annual meter reading cost (all meters on void properties are always read) plus an estimate of the average time per annum for CST checking void properties on normal meter walk.

2. Time spent by CSA checking for occupier names; £3.59

This is based on actual costs of a land registry check plus an estimate of time by CSA carrying out the check..

3. Connect and bill new property; £9.11

As calculated in Line 20.

Unmeasured properties (£22.23)

We have priced the following scenario:

- Annual check on Parish-by-Parish basis of void Properties using billing system
- Send new occupier leaflet and letter
- CST visits to confirm occupancy
- Form returned and account set up

The cost has been broken down into five stages:

1. Annual check of void properties; £0.20

Estimated time for CSA to generate unmeasured property report and confirm property status.

2. Send new occupier leaflet and letter; £1.50

Estimated time for CSA to generate and send leaflet and letter along with actual costs of company literature and postage.

3. Time spent by CSA checking for occupier names; £3.59

This is based on actual costs of a land registry check plus an estimate of time by CSA carrying out the check

4. CST visit to confirm occupancy; £8.83

Estimated time for CSA to arrange and diarise visit by CST along with estimated costs of CST visit to property.

5. Connect and bill new property; £9.11

As calculated in Line 20.

Line 24 : Finding and billing a formerly unrecorded property

The cost incurred for finding and billing a formerly occupied void property is calculated to be £43.53.

We have priced the following scenario:

- New property to be identified by CST as unique exercise
- Check for property owner on Land Registry
- Verify ownership through letter and visit
- Set up account as if connecting and billing a new property

The cost has been broken down into two stages:

1. New property identified by CST on meter walk; £23.57

We have estimated the time spent by a CST taken to identify a new property and inform HQ.

2. Verfy and charge account as per finding and billing a new property; £19.96

As calculated in Line 22.

Table C7.2
Water service – Measured non-household (potable)

Block B Post Privatisation Special Agreement (potable)

'SECTION REMOVED AND REPORTED IN PR09 EXCISION DOCUMENT'

Block C Group A (potable)

The data included in this section includes Measured Non household customers who use between 0 and 5 Ml per annum and is our largest group of Non household measured customers. The volume used is based on data from our billing system as used in the June Return and the Principle Statement 2008/09. Volume charges are based on a percentage of the standard measured household customer charges.

Block G Group E (potable)

The data included in this block relates to measured non household customers who use between 5 Ml and in excess of 25 Ml per annum. This group of customers are billed on a monthly basis and are subject to seasonal tariffs. General tariffs are based on a discounted version of the standard Household measured tariff as shown on line 43.

Block H Group F (potable)

The data included in this block relates to measured non household customers who use between 25 Ml and in excess of 50 Ml per annum. All of the customers in this group are billed monthly and are subject to seasonally adjusted discounted tariffs. The seasonal tariff has an above average price for water consumed in June, July and August and a lower than average tariff for water consumed in the remaining months of the year. For the purposes of the business plan the tariff for this class of customer has been expressed as a percentage of the standard measured household tariff.

Block I Group G (potable)

The data included in this block relates to measured non household customers who use between 50 and in excess of 100 Ml per annum. All of the customers in this block are billed monthly and are subject to seasonally adjusted discounted tariffs.

The seasonal tariff has an above average price for water consumed in June, July and August and a lower than average tariff for water consumed in the remaining months of the year. For the purposes of the business plan the tariff for this class of customer has been expressed as a percentage of the standard measured household tariff.

Table C7.3
Water service – Measured non-household (non-potable)

There is no measured non-household (non-potable) revenue to report for Tendring Hundred Water Services.

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C8.3
Summary of Carbon and greenhouse gas balance sheet

Overview

The information provided in this table is consistent with that used to calculate the CBA in table 8.1 with the exception of Line 1, column 5 as described below.

Block A – Water Service

Line 1

Column 5 has been calculated as the changes in direct and indirect operational emissions expected at 2014/15 against the figures for 2009/10, per megalitre of water supplied.

This is the sum of the two figures in column 7, which are the expected changes, divided by a figure of 29.77 Ml/d. This figure has been used in the demand forecast model for 2014/15.

Block B – Base service

The line for maintaining current service in terms of key serviceability indicators has been left blank as there are no additional annual emissions, except for one included in a project in the same block.

There are four sub-projects included in this block which correlates with table C8.1 in line with the reporting requirements. This differs slightly from the draft business plan submission, where seven sub-projects were included. The four potable trunk main projects have been combined into one sub-project.

All of these projects have been run through the cost benefit analysis solutions workbook and the outputs included in columns 4, 6 and 7 are taken directly from this.

The only sub-project with an additional operational emission is the new pumping station at Dovercourt. This addition is for the extra pumping that will be required at the new site, when compared to the existing site.

Block C – Enhanced service levels

There are no entries in this block.

Block D - Supply/demand balance

The line for maintaining current level of security of supply for expected demand has been left blank as there are no additional annual emissions, except for one included in a project in the same block.

There is one sub-project included in this block which correlates with table C8.1 as per the reporting requirements.

This project has also been put through the cost benefit analysis solutions workbook and the outputs included in columns 4, 6 and 7 are taken directly from these.

The project shows that operational emissions will reduce therefore making the project environmentally beneficial.

Block E – Quality enhancements

There are no entries in this block.

Block F – Individual Large Projects

There are no entries in this block.

Table C9.1 Commentary
Additional Financial Model inputs

The Company has prepared its business plan for AMP5 using a detailed internal financial model to translate its preferred strategy into the data required for the PRO9 Information Capture System. This model has been audited by the Company's Internal Audit team.

The Reservoir financial model has been populated from the Company's expenditure profiles and revenue assumptions, as generated by its own financial model, and as input into the ICS system.

The base data provided in Table C9 is the additional information required to enable the financial model to perform the calculations necessary to produce a detailed profit and loss account, balance sheet and cashflow, together with a number of other financial reports.

The share information, dividend cover, loan information and rates, overdrafts and cost of capital, debtors and creditors, and other financial indicators are all taken from the companies own financial model and are consistent with the information in the June Return and Regulatory Accounts.

The company has made assumptions as required in lines PB00001, 36 and 55 for RPI, COPI and IOPI based on its best projections.

Whilst every effort has been made to validate the output from the Reservoir financial model, the Company is reliant upon the model accurately translating its Preferred Strategy into price limits.