Reporter’s Report on the June Return

Report on Board Overview
By Exception Report on Tables
General Report
Appendices

June 2011
SUTTON AND EAST SURREY WATER

REPORTER’S REPORT ON THE JUNE RETURN

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INTRODUCTION AND REPORT LAYOUT

Ofwat Information Note IN 11/02 explained the broad philosophy for the 2011 June Return (JR11) which is viewed as a stepping stone to lighter regulation and a risk-based approach to the audit process. Companies were asked to provide a Board Overview that focuses on material issues. Companies were not expected to provide individual table commentaries although they were to provide additional explanatory information if considered necessary.

Reporters were expected to examine Company information in a similar way to previous years although certain tables (or sections of tables) were specifically excluded from audit. These exceptions comprised DG7 (response to written complaints) and DG9 (telephone contact) that were to be subject to a horizontal audit (covering all companies). Health & Safety (Table 41) was another new exception.

Reporters were asked to provide a single report to Ofwat setting out material issues and changes in methodology that have been found during the audits. The report is also to comment, by exception, on changes that have not been highlighted by the Company or where the Company exceptions require further clarification. Individual table commentaries are not required.

This report comprises essentially five sections:

- Report on the Board Overview which follows the layout of the Board Overview for ease of reference (Sections 1 to 7);
- Report, by exception, on the JR11 tables (Section 8)
- Reporter’s general report (Annex A)
- Levels of Service certificate (Annex B)
- Company’s response to challenges on the water balance and leakage (Annex C)

REPORT ON BOARD OVERVIEW

The Sutton and East Surrey Board Overview for JR11 is structured along the lines of the recent Ofwat discussion paper “Inputs, outputs and outcomes – what should price limits deliver?” The document defines the terms as follows:

- Outcomes are the things that customers and society value such as a reliable service to provide clean drinking water;
- Outputs are specific things that the companies deliver to help to achieve those outcomes such as compliance with drinking water quality regulations;
- Inputs are the resources that the companies use to deliver those outputs such as the investment needed to comply with drinking water standards

The Reporter’s comments in the following Sections (1 to 7) follow the same structure as the Board Overview, for ease of reference. Each section is split into the high level outcomes, outputs and inputs. The comments are limited to material issues or points of clarification and, in some cases, refer to more detailed comments on the individual tables in Section 8 of this report.

The report also notes where issues raised in the Board Overview are outside the scope of the Reporter’s expertise or were specifically excluded from the JR11 audit process.
1 EXECUTIVE SUMMARY

1.1 Chairman’s highlights

The Reporter confirms that the Company has achieved a good quality of service and its customers have received an uninterrupted supply of high quality water as described in the Chairman’s statement.

The Chairman’s highlights in the Executive Summary state that the Company has achieved the leakage target but do not refer to issues that the Reporter considers material and were raised as part of the JR11 audit. These were brought to the attention of the Audit Committee meeting that was held on 1st June 2011 and are discussed in further detail in the comments on Table 10 (Section 8 of this report). The Company’s response is that it would not expect these items to be raised in the Chairman’s highlights because the reported leakage figure has been calculated using the same methodology that has been used for the last 16 years as explained to and accepted by the last three Reporters. The Company also comments that leakage target and SELL are based on the same approach.

1.2 Key financial figures

Capital expenditure in the report year at £XXm was substantially below expenditure in the previous year (£XXm) and about £XXm less than the level of expenditure envisaged in the Final Determination (FD), Table 35B. In Section 4.2.3 of the Board Overview, the Company comments that it was less than the FD due to a slow start as spend was prioritised following the FD and including delays to the start of Reservoir A WTW phase 2 and associated infrastructure works. There was some overhang from AMP4 (for example, Reservoir A WTW phase 1). The capex forecast for the report year was set low by the Company, anticipating the slow start to AMP5. The Reporter notes that the capex budget for the current year is set much higher at £XXm.

1.3 Headlines

Under outcomes, the Company comments that Reservoir A WTW Phase 1 was substantially completed by the end of the report year. Some commissioning tests at the treatment works commenced in April 2011. The Company will be in a position to provide a peak throughput of 45 Ml/d this summer but would not have been able to provide 45 Ml/d in the peak period during the report year (summer 2010). The Company states that it would have been in a position to deliver 45 Ml/d before the end of the report year even though some commissioning tests were not completed.
2 RELIABILITY OF DATA

2.1 General

The majority of the JR11 audit work confirmed that data quality and accuracy was of a high standard. During the audits, the Company was asked to confirm whether any changes had been made to data sources, procedures or assumptions since JR10. Specific concerns were raised with regard to some of the components in the Table 10 water balance and these are discussed in Section 8.

During the audit, the Reporting Team noted that there were very few written procedures for preparation of June Return information. This was flagged to the Audit Committee as a point of concern both in terms of providing an audit trail of June Return information and in terms of business continuity and change control.

The Company’s view is that they have a small dedicated team who are familiar with the procedures and processes and there is a balance between the cost of maintaining procedures and the risk involved. It was agreed that a risk-based review would be carried out and procedures would be prepared where considered appropriate.

The processes for Accounting Separation, adjustments for the MEAV revaluation and current cost depreciation are all carried out on spreadsheets outside the main financial system, Navision. The Company builds in a number of checks and balances throughout the process and the final answers are subject to final review and sense checks. However, the spreadsheets are complex involving a large number of pivot tables and the possibility of error cannot be ruled out but no substantive issues were identified.
3 CUSTOMERS AND LEVELS OF SERVICE

3.1 Outcomes

In accordance with the guidance, this audit has included certain aspects of the Levels of Service performance. It has excluded the Service Incentive Mechanism (SIM) which is to be covered by a separate horizontal audit. It has also excluded the tracking research carried by Accent for the Company.

Based on this limited scope, the Reporter confirms that the Company has maintained a good level of customer service.

3.2 Outputs

DG2, properties at risk of receiving low pressure, remains as the same 40 properties as last year.

DG3, supply interruptions, were higher than last year. However, there were only three incidents that resulted in supply interruptions of greater than twelve hours. The accuracy of the DG3 source data has been improved as all DMA pressure loggers have been replaced.

No water usage restrictions (DG4) were applied during 2010/11.

The year on year change in the number of billing contacts was partly masked as a result of revisions to the HiAffinity codes used to track them. The DG6, response to billing contacts, performance was comparable to last year with 99.8% of contacts responded to within five days.

Overall performance for billing of metered customers, DG8, was comparable to recent years with 99.9% of metered customers being billed based on a meter reading.

There has been a small drop in the number of customers on the Special Assistance Register. The figure reported is the number of properties on the register but should be the number of people registered.

3.3 Inputs

Installation of selective meters has been slightly lower (11%) than the target for 2010/11 but this has been partly offset by the higher than planned level of optant meters. Overall meter installation is 6% below the target for this year. The main cause for this shortfall is probably the depressed housing market.

An internal review of customer services, “Project Vision”, has resulted in a programme of revisions to some of the Company’s procedures, systems and structures. The most significant one of these for JR11 was the revision of HiAffinity (billing system) codes for billing contacts. This change means most of the non-billing types of contacts that had previously been included as billing contacts have now been excluded. The number of reported billing contacts has reduced by 77,000 compared to JR10 and the recoding is thought to be responsible for about 55% (41,000) of the reduction.

Other changes resulting from Project Vision will not be evident until JR12.
4 OPERATIONAL

4.1 Maintenance infrastructure renewals

The number of bursts has been reasonably level over the past ten years (see graph below) but there has been a small year on year rise for each of the last three years. The Company has noted that this recent increase does not represent a decline in serviceability and that the burst rate at 91 bursts/1000km is much lower than the national average. While this is reasonable the targeting and level of expenditure on future mains renewals will have to be monitored for their impact on the burst rate.

The reference level for bursts given in the PR09 Final determination is 334 burst per year so, even with the rise over the past three years, the current annual burst rate of 314 is still below the reference level. The high and low burst levels in the Final Determination were 457 and 211 respectively.

The Company has not used the Ofwat spreadsheet to underpin their opinion on infrastructure serviceability. The Reporter accepts the conclusion that serviceability is stable.

There was a £XXm under-spend on IRE in the report year with 18km of mains being replaced compared with the target of 27km/year for AMP5 and the 33km reported in the final year of AMP4 (2009/10). Hence, the FBP proposals for AMP5 were not a ramping up from a previous low level but continuation of a similar volume of work that had been achieved towards the end of AMP4. The Company has not provided an adequate explanation for the under-spend but comments that the AMP5 target will be achieved.

4.2 Maintenance non-infrastructure

The Company has not used the Ofwat spreadsheet to underpin their opinion on non-infrastructure serviceability. The Reporter accepts that non-infrastructure serviceability appears to be stable. The number of unplanned work orders as a proportion of the total number of work orders being similar to last year at 18.3% (JR10 was 17.0%). The total number of work orders issued during 2010/11 was recorded as 8,914 compared to 7,039 for 2009/10 however, the range of work now being recorded has increased so the significance of this increase cannot be easily assessed. A detailed study of the work order records on the new management system (Agility) would be required to determine if this increased number of work orders reflects a change in serviceability.

Expenditure on MNI in the report year of £XXm was very substantially below FD by about £XXm. The delayed start to Reservoir A WTW phase 2 had a modest impact as work was progressing during the year on the delayed Reservoir A WTW phase1. The Company comments...
that the other reason for the slow start was prioritisation of spend following the Final
Determination. The Reporter notes that the Company set the capex forecast for the year
significantly below the determination.

4.3 Water resources

There were no restrictions on supply during the report year and surface sources were in a
healthy position at the start of the current year although groundwater levels were below
average. A record dry spring has increased demand in the first few months of the current
year but the Company is confident that restrictions will not be required this year. A wet winter
is needed to replenish groundwater sources.

The Reservoir A WTW phase 1 scheme will be fully tested and commissioned for summer
2011 to provide a peak output of 45 Ml/d. On the basis that the
work was substantially complete by the end of the report year (31st March 2011), the
Company has reported an improvement in the Security of Supply Index (SoSI) for the critical
period (peak week) in the report year. This has been challenged by the Reporter and there
are further comments in Section 8, Table 10A.

The Company reports a leakage figure of 24.5 Ml/d for the year which is equal to the Ofwat
target.

In the Reporter’s view, the Company’s approach to the estimation of the water balance and
leakage does not represent good practice in certain areas. The reasons are set out in detail
in Section 8, Table 10. They relate to the overall approach to the water balance, the
exclusion of any increase in summer leakage above the calculated average, the assumption
of no leakage from service reservoirs and trunk mains, the robustness of the domestic
consumption monitor and the logging of domestic and commercial night-use. In response to
the Reporter’s challenges, the Company states that it has consistently employed the same
methodology for over 16 years and that the transparent process it applies has been audited
and approved by numerous Reporters. The consistent approach also formed the basis for
establishing the leakage target and SELL. The Company also commissioned a response to
the challenges from a consultant, Artesia, and this is attached as Annex C to this report as it
provides a useful contribution to the debate. The Company acknowledges most of the
deficiencies and has undertaken to carry out a review in the short term to assess the way
forward for PR14.

The reported leakage figure needs to be consistent with the approach used when the leakage
target was set. The Company argues that the methodology has remained consistent. The
Reporter notes that for the report year, the period where a summer average leakage was
used was 5.5 months compared with about 3 months in JR10 and 4 months in JR09. Also,
the Company has not been able to replicate the reported figure of 186 l/head/day for
unmeasured domestic consumption with the results from either the District Meter Area (DMA)
consumption monitor or the Small Meter Area (SMA) consumption monitor. The SMA monitor
was introduced to improve the robustness of the unmeasured consumption estimate but the
Company is reporting output from only 14 of the 24 SMAs for various reasons including meter
failure.

In terms of capital expenditure on supply demand, the £XXm under-spend against the FD is
partly related to the Reservoir A WTW Phase 2 delay (as both the Phase 1 and Phase 2 projects
have a supply demand component). It is also partly due to the lower than expected addition
of new properties and the associated infrastructure. Capital contributions from Developers
are also down by 50% on FD projections.

4.4 Water quality

Table 9 of the June Return, which related to water quality, has been removed from the JR11
requirements. Hence, water quality issue are now outside the specific scope of the
Reporters’ audits. The comments in Section 4.4 of the Board Overview are consistent with our understanding of the Company and we have no further comments to add.

4.5 Security

Refer to March SEMD report to Defra (with annex for Ofwat)

During the audit of the allocation of capital expenditure, the Reporter noted that an element of work on completing improvements to service reservoir security (£XXXk) was allocated to MNI rather than SEMD (which is part of the quality enhancement programme). This was challenged but the Company commented that the improved security measures were not funded under SEMD and were therefore allocated to MNI.

4.6 Environmental matters

Greenhouse gas emissions were higher than the previous year mainly due the higher volume of water supplied. Some of the increase in emissions is also a consequence of the energy supplier introducing a new peak charge period from 16:00 to 19:00 during week days. To control costs, the Company aims to minimise pumping during this peak charge period but, in simplistic terms, this means water needs to be pumped into supply (service reservoirs) at a higher rate during other times. Although this higher pumping rate costs less overall it results in higher energy use and therefore higher CO₂ emissions in kgCO₂e/Ml terms.

4.7 Health & Safety

The Reporter is no longer required to comment on Table 41, Health & Safety and is unable to comment on Section 4.7 of the Board Overview.
5 FINANCIAL

The Reporter is not qualified to comment on the financial outcomes and outputs in Sections 5.1 and 5.2 of the Board Overview. Section 5.3 deals with financial inputs and some of these have been reviewed as part of the Reporter’s duties and comments are provided below, where appropriate.

**Operating costs**

Overall there has been a reduction of £XXm in operating costs between 2009/10 and 2010/11. Half of this has been due to savings in power costs as a result of the fall in market prices and the pre-bought energy supply contract that the Company now has for the period up to 2015. These savings compare to the previous 40% increase in power costs that partly led to the Company’s Substantial Adverse Effects claim to Ofwat.

Other significant savings were the reduced expenditure on external services and a reduction in employment costs as the number of staff fell by about 6% through natural wastage.

Expenditure on leakage controls added £XXm to Hired and Contracted services (Line 4 of Table 21) compared to the previous year.

There are some year on year changes that do not reflect saving, for example Other Business Activities (Line 15 of Table 21) has reduced by about £XXm. Most of this change is due to the one off cost of the Company’s appeal to the Competition Commission regarding Ofwat’s assessment of the Company’s claim for Substantial Adverse Effects. In JR10 the Company had included about £XXm of actual cost plus an estimate of £XXm for further fees.

**MEA revaluation and capital charges**

The Company does not have written procedures for either the revaluation or the accounting separation processes, both of which are relatively complex and are carried out on several spreadsheets with multiple pivot tables. The Company agreed to review this on a risk-based and business needs basis but comments that the review identified no material issues as a result of the absence of written procedures.

The revaluation exercise on the Modern Equivalent Asset Value (MEAV) at report year prices is consistent with the MEAV in Table C3.1 of the Final Business Plan (FBP) at 2007-08 prices, taking account of disposals, additions and RPI adjustments. Further comments on the Company’s methodology are included in Section 8, Table 25A.

The Company has made no changes to the systems, methodologies and processes underpinning current cost depreciation (CCD) other than the revaluation of assets. The total depreciation charge of £XXm is £XXm higher than for JR10 mainly as a result of the revaluation adjustment. A comparison of CCD on assets existing at 31/03/08 and total CCD as projected at PR09 in the FBP (Table B7.3) and the actual values for the report year shows that there is reasonable consistency for assets existing at 31/03/08 but actual CCD for the report year is significantly lower than the forecast (inflated by RPI). This is mainly due to the capex under-spend in the report year.

The Company calculates the infrastructure renewals charge (IRC) as the average infrastructure renewals expenditure (IRE) over the AMP5 period. In the report year, IRE of £XXm was less than the charge of £XXm leading to an accrual of £XXm which the Company states will be reduced to zero in 2015. The Company comments that the AMP6 expenditure forecast on IRE is expected to be similar to AMP5 and hence IRC represents the Company’s medium term view of IRE.
6 EXPENDITURE

Capital expenditure

This Section of the Board Overview largely repeats previous sections on operational inputs which also discuss capital expenditure. The Reporter has commented earlier in Section 4. The key points are as follows:

- Capital expenditure in the report year was significantly lower than assumed within the FD for the reasons stated by the Company (Reservoir A WTW delays and capital programme prioritisation): the Reporter also notes that the capex programme for the year was set lower than assumed in the FD.
- Infrastructure renewals (IRE) at £XXm were £XXm below FD.
- Maintenance non-infrastructure (MNI) at £XXm was £XXm below FD.
- Gross capex for supply demand at £XXm was £XXm below expectation and capital contributions at £XXm were £XXm below FD.
- There was no spend on enhanced service levels (as expected) and a small spend on the quality programme (replacing lead communication pipes) which was lower than expected.

The Reporter notes that the capex budget for the current year has been set at £XXm, much higher than the £XXm outturn in the report year.

Operating expenditure

Comments on operating expenditure were covered in Section 5.
7 PERFORMANCE AGAINST REGULATORY OUTPUTS

This section of the Board Overview tabulates performance against regulatory outputs that have been discussed in previous sections of the Overview. The Reporter has commented, where appropriate, in Sections 1 to 6 of this report with supporting details in Section 8.
8 REPORT BY EXCEPTION ON JUNE RETURN TABLES

8.1 General

In accordance with the guidance, this section of the report focuses on material issues. In particular, the Reporting Team has:

- Checked that the Company has complied with the process of submissions document or has included a commentary in its overview as to why the guidance has not been followed or the underlying methodology has changed from the previous year;
- Identified any material changes to company systems, processes and models which have not been highlighted to Ofwat by the Company;
- Reported by exception; and
- Commented on confidence grades provided in the ICS where the Reporter feels the grade is inappropriate.

8.2 Comments on Tables

Table 1: Promoting efficient use of water

The Company does not use the spreadsheet provided with UKWIR report 09/WR/25/4 but uses its own internal spreadsheet to estimate water efficiency savings. The Reporter recommended that the Company should try to replicate the 2010-11 figures on the UKWIR spreadsheet and use this version going forwards. The Company considers its own spreadsheet to be more flexible but consistent.

The Company confirmed that all assumptions regarding, for example, the number of flushes, estimates of savings and installation rates are consistent with Appendix 1 of the guidance. Audit checks verified this but noted that a high occupancy rate of 4.5 was used when targeting schoolchildren. The Company commented that this assumption was based on a survey comprising a show of hands from children during the 33 school visits. Assumed savings from packs distributed to school children amount to about 6% of household savings from Cistern Displacement Devices.

The Company was not funded in the FD for any SELWE water efficiency work and so reports zero in Block H of Table 1.

Table 2: Water Service key outputs

DG2: Low pressure of flow

The Company’s DG2 register contains the same forty properties it had last year and for the past few years. The level of each of these properties is within 15m of the normal operating water level in the service reservoir supplying it.

During this report year, the Company has replaced all of its pressure loggers located at the flowmeters into each of its 292 DMAs. The new loggers are regarded by the Company as being more accurate and reliable so there should be less false low pressure events due logger faults. These new loggers record the instantaneous pressure every fifteen minutes whereas the previous loggers recorded the average pressure over each fifteen minutes.

For DG2, the Company uses only the pressure at the DMA flowmeter. To identify a low pressure event, the Company calculates a surrogate pressures at the flowmeters / loggers which gives 15m pressure at the critical point within each DMA.
The significant increase in Line 4 (Properties receiving low pressure but excluded from DG2) is attributed to two large bursts; one of which affected 5,874 properties and the other affected 1,628 properties.

**DG3: Supply interruptions**

The Company continues to base the time an interrupted supply is restored on the time the repair team reopens the valve supplying an affected area. This is not necessarily compliant with the DG3 requirements that “*End time is when the company is satisfied that water has been fully restored to an acceptable pressure to the affected properties*”. The Company notes, however, that the time taken for mains to recharge and restore supplies to all properties is generally fairly short so it regards the use of the valve opening time as appropriate.

Due to chalk deposits in the Company’s Sutton area, some burst repairs are delayed until night time so that any discolouration caused by the chalk deposits can be controlled. As required for DWI, the Company maintains a separate set of records for these interruptions.

Although Line 7, properties affected by unplanned interruptions of more than 12 hours, has increased compared to the previous year, these were due to only three such incidents. This increase is unlikely to be indicative of a decline in the serviceability of the mains system.

**DG4: Water usage restrictions**

The Company did not impose any restrictions on water use during the 2010/11 report year.

**Table 4: Customer Service - 1**

**DG6: Response to billing contacts**

For the start of 2010/11, the Company amended its codes in HiAffinity for recording billing contacts. The new codes are designed to directly reflect the categories for Table 5B. This is regarded as being one of the main reasons for the fall in billing contacts reported in Table 4, Line 1. The new codes mean that a like-for-like comparison with previous years is not possible.

These new codes are:

<table>
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<th>New code</th>
<th>Included in DG6</th>
<th>Excluded from DG6</th>
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<td>GSS4</td>
<td>Arrangement refusal</td>
<td></td>
</tr>
<tr>
<td>X01</td>
<td>Information request</td>
<td></td>
</tr>
<tr>
<td>X02</td>
<td>Account query</td>
<td></td>
</tr>
<tr>
<td>X03</td>
<td>Making a payment</td>
<td></td>
</tr>
<tr>
<td>X04</td>
<td>Providing a meter reading</td>
<td></td>
</tr>
<tr>
<td>X05</td>
<td>Change of payment terms/account detail</td>
<td></td>
</tr>
<tr>
<td>X06</td>
<td>Moving house</td>
<td></td>
</tr>
<tr>
<td>X07</td>
<td>Referred to another company</td>
<td></td>
</tr>
<tr>
<td>X08</td>
<td>Payment following recovery action</td>
<td></td>
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<tr>
<td>X09</td>
<td>Arrange appointment</td>
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<td></td>
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<tr>
<td>X53</td>
<td>Website bad</td>
<td></td>
</tr>
</tbody>
</table>
Customers can now pay their bills via the Company’s website using a facility provided by Capita Ltd and this was used by 24,513 customers during the report year. These payments are not included in the DG6 definition and are therefore excluded from the reported figures. These will also account for some of the reduction since last year.

Although a direct like-for-like comparison is not possible due to the new codes, if the following assumptions are made:

- all payments now made via the web site would have been made via a method previously included in the reported DG6 figures, and,
- the contacts now coded as excluded from DG6 (X06, X41, X51, X52 and X53) where including in the previous HiAffinity DG6 codes,

There appears to be a year-on-year reduction of about 11,000 contacts (e.g. an improvement of about 4% to 5%).

The number of properties connected for water supply only, as reported in Line 6, is the average of the number of connected properties on 31st March 2010 and 31st March 2011.

Table 5: Customer Service - 2

**DG7: Response to written complaints**

DG7 is excluded from this audit as it is part of the horizontal audit on the Service Incentive Mechanism (SIM).

**DG8: Bills for metered customers**

All the data for the DG8 figures is sourced from HiAffinity, the Company’s billing system. The figures produced by HiAffinity were reviewed and some adjustments were needed to allow for:

- Customers that needed to be re-billed due to the change in the VAT rate on 1st January 2011, and
- Back apportionment of accounts where customers notified SES too late about change of occupancy for them to be sent a bill at the appropriate time.

The initial review of the HiAffinity figures identified 10 VAT re-bills and 12 back apportionments. However, following our random sample review of these DG8 figures some further minor adjustments were made to Lines 8, 9 and 10.

The Confidence Grades of A2 assigned to Lines 6 to 10 are regarded as appropriate by the Reporter.

**DG9: Telephone contact**

DG9 is excluded from this audit as it is part of the horizontal audit on the SIM.

**Special Assistance Register**

The Company’s database for the SAR is called the Sensitive Customer Database and has two sets of customers:

- The formal Ofwat SAR which includes only customers that have asked to be added to the SAR, and
- A list of customers developed by SES.

The second set of customers includes:

- School / college
- Nursing Home
- Dentist’s Surgery
- Doctor's Surgery
- Hotel
- Sheltered housing / association
- Airport
- Veterinary's Surgery
- Playschool / Nursery
- Day centre
- Hospital
- Police station
- Fire station
- Special needs customer
- Prison
- Food preparation
- Health Centre

This second set of customers is not included in the figure reported in Line 17 as they have not asked to be on the SAR. SES has developed this list as they are organisations etc that SES would want to take account of (e.g. warn) if there was planned maintenance or a supply incident.

The figure reported in Line 17 is the number of properties on the SAR but this does not necessarily match the reporting guidance which requires Line 17 to reflect the number of consumers on the register. HiAffinity, as currently configured, does not have the facility to individually record or report the number of people on the SAR.

The figure reported is based on data from HiAffinity that is processed in a spreadsheet using pivot tables to remove any double-counting of customers that are registered for more than one service. No estimation, extrapolation, etc is used.

The number of customers on the SAR has decreased from 1,727 last year to 1,705 at the end of 2010/11, a reduction of 22. In general, the reason for the decrease is simply that the uptake rate is less than the rate of SAR customers who are leaving.

The Company’s methodology in general has not changed from last year except that the categories of “Wheelchair”, “Colostomy”, “Diabetic” and “Medical needs” are now all grouped into one category called “Medical needs”. This change was made to be consistent with the national scheme. “Dialysis customer” is still a separate category.

Tables 5A and 5B: Response to written complaints and unwanted telephone contacts

Tables 5A and 5B are excluded from this audit as they form part of the horizontal audit on the SIM.

Table 6: Customer Service Standards

All data for Table 6 have been produced from HiAffinity and then processed in a spreadsheet using pivot tables to collate the payments into the appropriate groups to reflect each Line of Table 6.

Separate records have been used by SES to validate the data from HiAffinity. For example, the system for booking and recording progress with appointments has been used to check the HiAffinity data for GSS payments for appointment failures.
As a result of SES’s own review of the appointment monitoring system, the Company has revised the system as it was possible with the system used in 2010/11 to leave the status of an appointment blank. Whilst this would normally only be done for appointments that were met it did mean that some missed appointments could possibly slip through the net. The new system has a dropdown menu for the appointment status so the status cannot be left blank. Following discussion between the Reporter and the Company, the system will be adjusted so that the default status of an appointment be “Pending”.

Table 6A: Bad Debt

Bad debt is excluded from the Reporter’s audit.

Table 6B: Applications for Vulnerable Customer Status (WaterSure)

As SES is a water only company, its customers receive their sewerage services from another company, either Thames Water or Southern Water. SES bills its customers for sewerage services on behalf of Thames Water but not for Southern Water. SES does not know if the other two companies include or exclude SES’s customers from the figures reported in their figures for Table 6b.

Customers are billed based on the WaterSure tariff but at the end of each year the payments are reviewed to assess whether the amount paid was less or more than the measured use. If the measured use was lower than the WaterSure tariff, the customer’s account is credited with the difference. Such refunds are only necessary in a few cases each year.

Our checks of the WaterSure information on the Company’s website identified that the tariffs for 2011/12 had not been updated to show the latest tariff. This has now been corrected by the Company.

Table 7: Properties, Billing and Population

The methodology for calculating estimates of properties and population has not changed from previous returns.

Table 8: Water Metering

The following table compares the Company’s actual meter installations with the outputs required by the AMP5 Final Determination.

<table>
<thead>
<tr>
<th>Meter type</th>
<th>Final Determination requirements</th>
<th>Actual number of meters installed</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional meters</td>
<td>1,680</td>
<td>1,785</td>
<td>106%</td>
</tr>
<tr>
<td>Selective meters</td>
<td>4,460</td>
<td>3,974</td>
<td>89%</td>
</tr>
<tr>
<td>Total</td>
<td>6,140</td>
<td>5,759</td>
<td>94%</td>
</tr>
</tbody>
</table>

SES’s plan for selective meters is to install them on change of occupancy. The shortfall in the number of selective meters installed is therefore due to the state of the housing market which was still depressed during the report year.
A customer’s status will be changed on HiAffinity from unmeasured to measured within a day or so of their meter being installed. The meter reading at installation (normally zero) is recorded and used for the customer’s next bill. Therefore, even if there is a delay in entering the meter into HiAffinity, the customer is charged on a measured basis from the day the meter is installed.

The Company’s procedures are such that, unless paperwork is mislaid, there is no significant time lag between carrying out meter installations and recording it on HiAffinity and MISS (Metering Installation Scheduling System).

**Table 10: Water Delivered**

The Company comments that it has consistently employed the same methodology for Table 10 for at least 16 years and that the transparent process it applies has been audited and approved by numerous Reporters. The consistent approach also formed the basis for establishing the leakage target and the Social and Economic Level of Leakage (SELL).

In the Reporter’s view, there are a number of areas in which the Company’s approach to the estimation of the water balance and leakage does not meet best (or good) practice. These were raised with the Company during the audit process in order to encourage the Company to move towards good practice for the next Business Plan, recognising that the JR11 estimate of leakage needs to be consistent with the way the leakage target was set. The Company disagrees that it does not follow good practice or that there is “best practice” in terms of leakage estimation.

In response to challenges, the Company provided a report by Artesia Consulting which is attached as Annex C to this report. The Company also has a report from Tynemarch entitled “Initial summer leakage investigation” that advises on the separation of leakage and night-use for the 2010 summer.

The Company has undertaken to carry out a review in the short term to assess the way forward for PR14 and to discuss this with the Reporter and keep Ofwat informed.

In the Reporter’s view, the main areas which do not meet good practice are:

- The overall process for deriving the Table 10 water balance in which the Company assumes that the residual in the water balance is unmeasured domestic consumption (rather than leakage) and this is then compared with an estimate of unmeasured household consumption from the domestic consumption monitor (DCM). The Company does not apply any maximum likelihood estimation (MLE) adjustment. Good practice would comprise basing unmeasured domestic on the DCM, assuming the residual in the water balance was leakage, comparing this with the bottom-up estimate of leakage and applying an MLE adjustment to the overall balance, if appropriate. The Company comments that it will review this again and, if appropriate, will consider a transition towards an MLE approach.

- The Company assumes that any increase in minimum night use during the summer period represents an increase in legitimate night use rather than leakage. The Company uses an average leakage over the summer based on leakage at a start date and end date of the summer period. The Company argues (Annex C) that averaging over the summer period is justified and points out that it is also used by two other companies (Southern Water and Essex & Suffolk Water) and that it was discussed and recommended in the context of small area monitors in UKWIR Best Practice for Unmeasured Per Capita Monitors (99/WM/08/25). However, the Company’s records of bursts (figure over-page) and the record on repairs (Figure 2 in Annex C) both show an increase in July and August indicating that a component of the increase in summer nightline represents leakage. The Company comments that increases in summer nighttime track distribution input and are predominantly
legitimate night use (as shown in the figure below). It also comments that there was a significant decrease in bursts in May and a low level in June in 2010.

- The Company assumes zero contribution to the bottom-up estimate of leakage from service reservoirs and trunk mains (other than an allowance for the properties fed directly from the trunk mains). The Company comments that it has no evidence that leakage in these two areas is significant but it will review the assumption.

- For previous returns, the DCM has been based on a statistical analysis of a number of selected District Meter Areas (DMAs) rather than on individually monitored
unmeasured households or Small Meter Areas (SMAs) that is the recommended approach. Following a review by Atkins in 2007, the Company developed some 24 SMAs with the intention of using these to provide a more robust estimate of unmeasured per capita consumption (upCC). A reference was made to these SMAs in the JR10 return but no detailed analysis was provided. For JR11, the Reporter expected that the SMAs would be the primary basis of upCC estimation. However, the Company comments that only 14 of the 24 SMAs are providing adequate information. The Company comments that several meters failed during the report year and the situation will be reviewed. The Company has no specific knowledge of household occupancy rates for either the DMAs or SMAs, using average company figures to convert litres/property/day into litres/head/day.

- The Company does not have an active logging programme for either domestic or commercial night use in order to better understand the seasonal variations of legitimate night use. A logging programme has been recommended by Tynemarch but the Company comments it has no plans to progress as it does not think it would generate data that is more robust than the UKWIR studies.

The Company acknowledges the issues raised on the current approach but does not agree with the conclusions. However, it has undertaken to carry out a review in the short term to assess the way forward for PR14 and to discuss this with the Reporter and to keep Ofwat informed.

There are a number of key areas where this year’s estimation of the water balance and leakage varies from that in previous years and these variations were also challenged. These key areas are:

- The extent of the summer period over which the Company assumes an average leakage between the start of the summer and the end of the summer. For JR11, the period extended from mid-April to the end of September (5.5 months). This compares with about 3 months for JR10 and 4 months for JR09. The assumed duration of the summer period has a substantial impact on the assessment of annual leakage. The Company was asked to provide a sensitivity analysis but has not done so. The Company’s view is that this does not represent a change as the underlying methodology has remained the same and the extent of the summer period is weather dependent. The selection of the summer period was confirmed in a report by Tynemarch.

- For JR10 and previous returns, the Company has carried out a statistical correlation on a selected sample of DMAs from a total of 66 DMAs (comprising the Company’s DCM) for comparison with the upCC derived as the residual in the water balance. For JR11, the Company comments that this approach has not been able to match the upCC in Table 10 of (186 l/h/d, Line 8). The analysis produces an unmeasured per household estimate of 427 litres/property/day which equates to 164 litres/head/day at the average unmeasured occupancy rate of 2.607. The Company confirms that it will investigate the reasons for the JR11 imbalance.

- For JR11, it was anticipated that the Company would rely more on the SMA approach than the DMA approach for upCC verification. However, it is very disappointing to note that only 14 of the 24 SMAs have been used in the analysis mainly due to failed meters. The current assessment from the 14 SMAs is providing an estimated 452 litres/property/day which equates to 173 litres/head/day (at a 2.607 occupancy rate). This calculation is underpinned by an assumption of very high meter under-registration for the SMA inflow meters in the range 2% to 14.5% (typical values 7% to 10%). These are not justified, in the Reporter’s view, for the Elster C4000 combination meters that have been installed. A figure of 3% is assumed for the customer meters feeding any measured properties in the SMAs. The Company comments that it intends to replace the meter component measuring the low night flow and send them away for independent verification.
The Company’s response to the challenges above comprised a report from Artesia Consulting which is provided in full as Annex C to this report. The Reporter does not accept all comments in the report, notably that it would appear unlikely that there is a significant increase in leakage during the summer period, that a summer averaging over 5.5 months is an appropriate methodology or that the proposed component errors in the MLE calculation should weigh heavily on uPCC rather than leakage as shown in the illustration. However, the broad thrust of the conclusions is reasonable with the additional comments that the Company should:

- Make a realistic assessment of trunk main and service reservoir leakage along the lines of the UKWIR recommendations in report 08/WM/08/38;
- Monitor samples of domestic and commercial users to better understand variations in legitimate night use;
- Move towards good practice for PR14, taking account of the further UKWIR report expected later this year as an update to Managing Leakage.

Some more aspects of the JR11 water balance are worthy of note:

- The ratio of unmeasured PCC to measured PCC (186 / 142 or 1.31) is significantly higher than typical industry values;
- The uPCC value of 186 l/h/d is likely to be higher than other companies for the report year;
- The billed unmeasured volume (Line 4) has risen in the last two years even though the number of unmeasured households had decreased through optional and selective metering.

In view of the discussions during the audit process and the fact that the uPCC has not been verified by the DMAs or SMAs, the Company has amended downwards the Confidence Grades for Table 10 compared with JR10 as follows:

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Confidence Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>JR10</td>
</tr>
<tr>
<td>8</td>
<td>uPCC</td>
<td>B2</td>
</tr>
<tr>
<td>30</td>
<td>Overall water balance</td>
<td>A2</td>
</tr>
</tbody>
</table>

Both changes are considered appropriate. In the Reporter’s view, the Confidence Grade of B2 for Line 25, total leakage, should also be downgraded from B2 to B3.

Table 10A: Security of Supply

The Company has followed the RD 03/02 guidance for calculating the Security of Supply Index (SoSI). The figures for Water Available for Use (WAFU), bulk imports and exports, dry year distribution input and target headroom are consistent with the Water Resource Plan update.

One issue that was raised during audit relates to the inclusion of the Reservoir A WTW Phase 1 upgrade in the WAFU for the critical period in the JR11 report year. Following completion of the Phase 1 works, the peak capacity of Reservoir A WTW increases from 36 Ml/d to 45 Ml/d. The Company takes the peak week as the critical period although this assumption has not been reviewed for many years. During the report year, the peak week would have occurred in the summer of 2010 and the reporting year figures in Table 10a(iii) relate to summer 2010.

The Company comments that the Phase 1 works were substantially complete on 31st March 2011 and therefore it is appropriate to include the increased WAFU even though it is reported in the context of summer 2010.
The following components of the Phase 1 upgrade were completed after the March 31st year end:

- GAC take-over tests started on 22nd March, completed in April
- Re-lift pumping plant take-over tests started on 28th March, completed after year end
- 28-day testing on washwater plant, clarifiers and UV plant all started in April 2011

In the Reporter’s view, it would be more appropriate for the Company to report the impact of the upgrade on peak SoSI in the context of summer 2011 (JR12) rather than summer 2010 (JR11). The impact on critical period SoSI would be a change from 97 to about 76.

The Company’s view is that the work at Reservoir A WTW was substantially complete by 31st March 2011 and therefore it is reasonable to report the improvement to SoSI in JR11. This is the approach the Company has consistently taken since the introduction of SoSI and has not been challenged before. Ofwat’s reporting guidance is not clear on when the peak SoSI snapshot should be taken.

Table 10B: Water Balance

The data presented in Table 10B(i) (annual average outturn) and Table 10B(ii) (critical period) are consistent with the data presented in Table 10 and the Water Resources Management Plan Second Annual Review submitted with JR11.

The Reporter has the following observations:

- There is a notable discrepancy between water efficiency savings claimed and the rising uPCC reported in Table 10 over last two years and reflected in Table 10B. The reported uPCC is impacted by the water balance and leakage methodologies (see earlier commentary on Table 10). The Company comments that water efficiency savings were fairly insignificant compared with increased demand due to dry weather conditions.

- The peak deployable output at Reservoir A WTW will reach 45 Ml/d in summer 2011 following completion of construction, commissioning and testing of the Phase 1 works at Reservoir A WTW (see earlier commentary on Table 10a). Peak output of 45 Ml/d was not available during the report year. The Phase 1 works were substantially complete at the end of the report year but were still subject to final testing. The Company states that peak deployable output of Reservoir A was 45 Ml/d before the end of the report year.

Table 11: Water Service Activities

All mains cleaning (flushing) was carried out to remove iron deposits. The figure reported in Line 4, Mains cleaned (total) includes one section of main twice so the total should be 10.79km instead of 13.45km.

Records of mains installations and abandoned mains are recorded in the Company’s MPD (Mains Projects Database). Mains renewals recorded in the MPD are compared to the GIS records to determine to what extent the records do not match. An adjustment length is calculated and included in the length reported in Line 8 – Mains abandoned and other changes. For this report year, 2010/11, Line 8 consists of:

| Corrections to new and abandoned mains for 2009/10 | 469 m |
| Mains abandoned in 2010/11 | 18,431 m |
| balancing length | 854 m |
| Line 8 total | 19,754 m |
A programme for replacement of lead communication pipes at schools is planned for AMP5 but was not started in 2010/11.

The Company’s required output for household meter renewals is 23,904 during AMP5 which is about 4,800 per year. The actual number installed by the Company during this first year of AMP5 is 4,322 which is about 10% short of the target.

For Lines 15 and 16 the Company has reported that 100% of its distribution zone studies have been updated. As in previous years, this is based on the Company’s view that as:

“the distribution department manages the day-to-day operations and plans its maintenance activities using systems and databases specifically developed by the Company to store its operational information. Any subsequent analysis of the network is therefore carried out with the latest available data. The Company continues to refine these systems to reflect an ever increasing demand for data driven by both operational and regulatory requirements.”

Table 11A: Serviceability Water Treatment

**Turbidity**

Analysis of turbidity results has been performed in accordance with the method in Appendix A of the Table 11a guidance. All test results were 0.3 NTU or less therefore all the 95%iles are below the 0.5 NTU threshold.

**Water non-infrastructure maintenance**

This is the third year that the Company has used its current maintenance management system (Agility) to produce the figure reported in Line 5, unplanned maintenance. During 2010/11, the Company raised a total of 8,914 work orders of which 1,637 were classed as unplanned maintenance. This is significantly higher (about 30%) than the 1,288 and 1,203 work orders issued in 2008/09 and 2009/10 for unplanned maintenance. The Company attributes this rise to the addition of builders to the maintenance management system. This change was made in 2010 and most of the work the builders do is unplanned such as roof leaks and gutter repairs. The Company notes that because the scope of work included in Agility has increased, the 1,637 cannot be compared on a like for like basis with the JR09 and JR10 figures. What should be compared year on year is the percentage of total work orders that are for unplanned maintenance. This has been close to the 20% level for JR09, JR10 and JR11 and therefore indicates a stable level of serviceability.

The changes to Agility also make comparison against the regulatory output (1,533 per year) problematic. Some adjustment may be required to the regulatory output so that it is based on the same scope of work now covered by Agility.

**Serviceability assessment – Water service**

The Company has not prepared any specific analysis for its assessment of serviceability and has not used the Ofwat workbook designed to help with the assessments. The Company has based its “Stable” assessment for both infrastructure and non-infrastructure on the absence of any significant decline in the various parameters used to assess serviceability in Appendix 2 of PR09/38. The Ofwat assessments for 2009/10 were “Stable” and therefore, as the parameters have not declined, the Company regards the “Stable” assessments as being still valid for this report year. The Company has highlighted, for example:

- Whilst the number of bursts has increased by 2% the Company’s burst rate of 91 per 1,000 kilometre is still significantly below the 2009/10 industry average rate of 179;
• There were only three incidents where supply interruptions exceeded 12 hours and these affected only 94 properties;
• The number of properties at risk of receiving low pressure has remained at 40 properties (0.01% of connected properties);
• Turbidity levels in water leaving water treatment works were all below the 0.5 NTU threshold;
• There was only one coliform non-compliance at a treatment works.

The Reporter considers the stable assessments to be reasonable but would encourage the Company to use the Ofwat workbook for future returns.

### Table 12: Water Explanatory Factors

#### Source types and pumping

Source types are unchanged from last year. The method used for calculating average pumping head has also not changed.

#### Number of works

The treatment work are unchanged from last year.

#### Potable mains

As in previous years, the split between size bands is based on data from the Company’s GIS. The small year on year changes to the length of mains in each band stem from the main replacement programme.

### Table 21: Regulatory Accounts (CCA): Activity Costing

The methodology used by the Company for Table 21 has not changed from that used for JR10. Cost data are downloaded from Navision (financial management system) to an Excel spreadsheet in the form of a trial balance. Where there is a close link between the Table 21 categories and the Navision cost codes the data is processed using pivot tables. However, for a lot of expenditure some form of manual processing is required to split the costs. An example of this is meter reading which is part of the Company’s distribution department but for Table 21 needs to be allocated to customer service and some to third party services.

Where costs have to be reallocated, the Company has based the reallocation on parameters that are generally regarded by the Reporter to be appropriate for the Company’s circumstances (e.g. man hours).

The Company’s reallocation process for Tables 21, 21a and 21b is very detailed and time consuming. Some parts of the process could be simplified where the materiality of the costs do not justify the complexity of the reallocation process. One example of this is the laboratory costs. A detailed review of the laboratory analysis activity costs was performed for JR10 and for JR11; these show little difference between the reallocation percentage between the two years.

<table>
<thead>
<tr>
<th></th>
<th>Water resources</th>
<th>Water treatment</th>
<th>Treated water distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>JR10</td>
<td>26%</td>
<td>45%</td>
<td>29%</td>
</tr>
<tr>
<td>JR11</td>
<td>23%</td>
<td>45%</td>
<td>32%</td>
</tr>
</tbody>
</table>
It would seem reasonable to exclude the detailed analysis in future years and reallocate on the basis of:

<table>
<thead>
<tr>
<th>Water resources</th>
<th>Water treatment</th>
<th>Treated water distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>45%</td>
<td>30%</td>
</tr>
</tbody>
</table>

The reallocation of power costs has been carried out using the assumption that 40% of all power use is for water distribution. The 40% is a historic figure and needs to be revalidated. This should be possible using some of the data prepared for Table 42 Greenhouse Gas Accounting.

Clarification JR11/011 highlights that costs of repairing Customer Supply Pipes should be within Line 21 “Third party services – opex” for Table 21. The Company has confirmed that these costs have not been included in Line 21 but are in the Water distribution column of Line 4.

**Table 21A: Activity Costing Water Service**

Figures for Tables 21A and 21B are prepared using the same source data as Table 21 (i.e. the trial balance downloaded from Navision) but with two additional codes downloaded for each cost. These additional codes are the accounting separation codes as developed for JR10. Where a cost does not match the accounting separation categories it has been assigned a “Sub-service” code of “split”; this applies to about 4% of cost items.

The general comments above for Table 21 regarding the appropriateness of reallocation methods apply to Table 21A also.

**Table 21B: Activity Costing Retail Service**

As noted above for Table 21A, the figures for Table 21B are prepared from the same source data as Tables 21 and 21A.

Clarification JR11/011 highlights that costs of repairing Customer Supply Pipes should be within Line 15 “Customer-side leaks” for Table 21B. The Company has stated that these costs have been split between Lines 10 and 15.

The general comments above for Table 21 regarding the appropriateness of reallocation methods apply to Table 21B also.

**Table 25A: Analysis of Fixed Assets by Business Unit**

**General**

The Company has made an adjustment for the revaluation of assets during this report year. This amounts to £XXm (£XXm on retail business unit and £XXm on other business units).

The Company does not have written procedures for either the revaluation or the accounting separation processes, both of which are relatively detailed and are carried out on several spreadsheets with multiple pivot tables. No errors were identified during the audit. The
Company has agreed to review the need for written procedures on a risk-based and business needs basis.

**Revaluation**

The revaluation exercise on the Modern Equivalent Asset Value (MEAV) at report year prices is consistent with the MEAV in Table C3.1 of the Final Business Plan (FBP) at 2007-08 prices, taking account of disposals, additions and RPI adjustments.

The following methods were used in the FBP to revalue assets:

- Operational assets: consultants visited sites to asset condition and MEAV
- Non-operational assets: revaluation based on experience and judgement
- Infrastructure assets: used the current length of mains times an estimated unit cost for different types of main
- A desk-top land re-valuation exercise was carried out.

The original work on the MEAV was carried out on spreadsheet <CCA 2008> containing information on approximately 5200 assets. A high proportion of the adjustment of £XXm relates to the value of infrastructure assets (increased by £XXm).

The re-valuation was carried out on two further spreadsheets:

- <CCA 2008 used for MEA revaluation figures for CCA 2011>
- <CCA 2011>

The Reporter has the following observations on the Company’s approach:

- Historic costs (HCA) are held in the Financial System (Navision) but not current costs (CCA)
- The Company allocates M000 codes to infrastructure projects and F000 codes to non-infrastructure projects
- Jobs become assets (for example, a pump refurbishment or a new pump will both become an asset) through the use of a F000 code
- The Company does not have general projects covering a number of sites
- There is generally one asset life assigned to a F000 code
- Larger projects are broken down into separate F000 codes with different asset lives
- The Company capitalises jobs on an annual basis at year end
- Some negative book values (total about £XXm) were produced after asset revaluation: these were removed and the equivalent value redistributed onto assets having a similar life.

**Accounting separation**

The Company has used a similar process to JR10 for accounting separation. The work was carried out on a separate spreadsheet <CCA 2011 with GT AccSep codes>. The process is detailed involving a large number of pivot tables. The Company has built in a number of checks and balances at various stages but the output could still have undetected errors.

There are no areas where the processes or systems were deemed inappropriate or where assumptions were deemed unreasonable except for meters. The Company assumes that the full cost of meter and boundary box is allocated to retail whereas the latest guidance expects only meters in retail and boundary boxes in treated water distribution. The Company comments that the impact is not material.

The General & Support function (excluding Scientific Services) has been split in a similar way to opex G&S (Table 21a) as follows:
Retail 25.9%
Raw water distribution 0.2%
Treated water distribution 30.4%
Water resources 10.2%
Water treatment 33.3%
Total 100%

Scientific Services have also been split in a similar way to opex:

| Treated water distribution | 32% |
| Water resources            | 23% |
| Water treatment            | 45% |
| Total                      | 100% |

Table 25C: Analysis of Fixed Assets by Business Unit: Retail Service

In general terms, the accounting separation into retail follows the guidance provided by Ofwat.

The Reporter raised one issue with regard to the split between household and non-household. The value of meters and the retail element of G&S, for example, are split on the basis of customer numbers. Commercial meters will be substantially larger than household meters and the provision of support services will be proportionally greater for commercial customers. The assumption of customer numbers introduces a bias towards household with a lower cost allocation being given to non-household customers than warranted. The Company comments that it wishes to keep the assumptions in this complex area as simple as possible and that the non-household cost per property is higher than most comparable companies which is contrary to the concern about bias.

Table 25A & C: Appendices

The Appendices were completed at a late stage by the Company and were unavailable at the main audit. A review of the supporting information indicates:

- The meter data in Appendix 1 includes the meter and the meter chamber: the latest guidance states that customer meter chambers should be allocated to treated water distribution rather than retail. The Company comments that this is not material.
- The Company has included a table showing the impact of the MEA adjustment with Appendix 1
- Figures brought forward from the previous year (Lines 1, 8 and 18) are pre-adjustment
- Figures at end of year (Lines 7, 16 and 17) are post-adjustment
- The figures for direct allocation in Appendix 2 indicate where the figure is obtained directly from a pivot table rather than being directly coded in the financial system: these figures include, for example, the percentage splits of General & Support and Scientific Services as shown above.

Table 32: Fixed Asset Additions and Asset Maintenance by Asset Type (CCA)

The Company does not have a written procedure for Table 32 or written rules for the proportional allocation of expenditure. The Company states that proportional allocation is carried out on a project by project basis based on an analysis of the contract sum. The Reporter has recommended that procedures and rules are prepared. The procedure for JR11
is similar to that for previous returns. The Company has developed a new capex pivot table for reporting and monitoring purposes.

A review of the spreadsheets was carried out as part of the audit process. This indicated that cost allocations were in accordance with RAG 2. An issue was raised with regard to service reservoir security work (£XXk) that was allocated to base service (MNI) rather than enhancement (SEMD expenditure under the Quality Programme). The Company explained that the work was not funded as SEMD expenditure and was therefore allocated to MNI.

An example of proportional allocation in the report year is Reservoir A WTW refurbishment which is allocated 80% Maintenance Non-Infrastructure (base service) and 20% Supply Demand Balance (enhancement): each component is further split by asset type / asset life assuming 40% civil, 55% M&E and 5% ICA derived from tender costs.

<table>
<thead>
<tr>
<th>F000 code</th>
<th>Asset type</th>
<th>% allocation</th>
<th>Base / SDB</th>
<th>£k in report year</th>
</tr>
</thead>
<tbody>
<tr>
<td>F0006657</td>
<td>Civil</td>
<td>40% x 80% = 32%</td>
<td>Base</td>
<td></td>
</tr>
<tr>
<td>F0006658</td>
<td>M&amp;E</td>
<td>55% x 80% = 44%</td>
<td>Base</td>
<td></td>
</tr>
<tr>
<td>F0006659</td>
<td>ICA</td>
<td>5% x 80% = 4%</td>
<td>Base</td>
<td></td>
</tr>
<tr>
<td>F0006660</td>
<td>Civil</td>
<td>40% x 20% = 8%</td>
<td>SDB</td>
<td></td>
</tr>
<tr>
<td>F0006661</td>
<td>M&amp;E</td>
<td>55% x 20% = 11%</td>
<td>SDB</td>
<td></td>
</tr>
<tr>
<td>F0006662</td>
<td>ICA</td>
<td>5% x 20% = 1%</td>
<td>SDB</td>
<td></td>
</tr>
</tbody>
</table>

The Company applies proportional allocation to mains renewals when the renewed main is upsized: the estimation is based on flow area.

**Table 33: Current Cost Depreciation and IRC**

**Depreciation charge by asset type**

The Company has made no changes to the systems, methodologies and processes underpinning current cost depreciation (CCD) other than the revaluation of assets. The assessment is drawn from the same spreadsheet used to derive Tables 25A and 25C. Review of the spreadsheet has not indicated any unreasonable assumptions or adjustments. The Company does not have a written procedure for derivation of CCD or IRC on Table 33.

The total depreciation charge of £XXm is £XXm higher than for JR10 mainly as a result of the revaluation adjustment. This impacts predominantly on the depreciation charge on assets existing at 31 March 1998 and additions from 1998 to 2003. There is no revaluation impact on additions after March 2008.

The following table shows a comparison of CCD on assets existing at 31/03/08 and total CCD as projected at PR09 in the FBP (Table B7.3) and the actual values for the report year. There is reasonable consistency for assets existing at 31/03/08 but actual CCD for the report year is significantly lower than the forecast (inflated by RPI). This is mainly due to the capex underspend in the report year.

<table>
<thead>
<tr>
<th>Values in £m</th>
<th>FBP Table B7.3 at (2007-08 prices)</th>
<th>FBP Table B7.3 at (2010-11 prices)</th>
<th>Table 33 report year (2010-11 prices)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCD on assets existing at 31/03/08</td>
<td>Table 33 report year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total CCD</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Infrastructure renewals charge**

The Company calculates the infrastructure renewals charge (IRC) as the average infrastructure renewals expenditure (IRE) over AMP5, as shown in the table below at 2010/11 prices. In the report year, IRE of £XXm was less than the charge of £XXm leading to an
accrual of £XXm which will be reduced to zero in 2015. The Company comments that the AMP6 expenditure forecast on IRE is similar to AMP5 and hence IRC represents a medium term view of IRE.

<table>
<thead>
<tr>
<th>(£m in 2010/11 prices)</th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
<th>2013/14</th>
<th>2014/15</th>
<th>AMP5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening prepayment (accrual)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure (IRE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charge (IRC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closing prepayment (accrual)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 34: Analysis of Non-Infra Asset Additions by Life Categories**

The Company has made no changes to the systems, methodologies and processes underpinning asset life categories since the previous year. Values for Table 34 are drawn from a pivot table on the same spreadsheet used to derive Tables 25A and 25C. Review of the spreadsheet has not indicated any unreasonable assumptions or adjustments.

The Company does not have a standard list of asset lives from which appropriate lives are selected when projects are set up. The Reporter has suggested that such a list would be helpful. The Company comments that each item of plant is given an asset life based on historical performance of that asset. There is some broad guidance listed in the CCA spreadsheet which summarises the ranges of assigned lives; these are broadly consistent with industry practice and are as follows:

<table>
<thead>
<tr>
<th>Asset type</th>
<th>Asset life (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil / buildings</td>
<td>80</td>
</tr>
<tr>
<td>Boreholes</td>
<td>55-80</td>
</tr>
<tr>
<td>M&amp;E plant and MCC panels</td>
<td>20</td>
</tr>
<tr>
<td>Generators</td>
<td>20-25</td>
</tr>
<tr>
<td>Pumps – submersible</td>
<td>10-15</td>
</tr>
<tr>
<td>Pumps – water</td>
<td>20-30</td>
</tr>
<tr>
<td>Instrumentation</td>
<td>10</td>
</tr>
<tr>
<td>ICA software</td>
<td>5</td>
</tr>
</tbody>
</table>

The Company makes the following assumptions for the lives of customer meters, distinguishing between the actual meter and other costs such as the boundary box and labour. The percentages of costs are split by asset life as shown in the table below.

<table>
<thead>
<tr>
<th>Meter type</th>
<th>Asset life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 years</td>
</tr>
<tr>
<td>New external</td>
<td>28%</td>
</tr>
<tr>
<td>Replacement external</td>
<td>28%</td>
</tr>
<tr>
<td>Optant / selective internal</td>
<td>40%</td>
</tr>
<tr>
<td>Optant / selective external</td>
<td>28%</td>
</tr>
</tbody>
</table>

There is generally only one asset life associated with each project (or F000 code). Where appropriate, projects are split into separate F000 codes and assigned separate lives. For example, Reservoir A WTW refurbishment is split as follows, based on estimates at contract award stage:

<table>
<thead>
<tr>
<th>F000 code</th>
<th>Description</th>
<th>% split</th>
<th>Asset life (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F0006659</td>
<td>Civil works</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>F0006660</td>
<td>M&amp;E works</td>
<td>55</td>
<td>25</td>
</tr>
<tr>
<td>F0006661</td>
<td>ICA works</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>
Table 35: Expenditure by Purpose

The Company confirms that all leakage detection work (internal teams and leakage contractors) is allocated to opex. Repairs are also allocated to opex. Items such as district meters, pressure and flow loggers, leakage software, pressure reducing valves (PRVs) are capitalised and costed to water distribution mains (non-infrastructure) on Table 32 and Maintenance Non-Infrastructure (MNI) on Table 35 in accordance with RAG guidance.

The Company has correctly allocated zero expenditure against Line 14 (new outputs / obligations).

Table 35A: Expenditure Comparison by Purpose

Base operating expenditure is down by £XXm mainly as a result of savings in energy and employment costs.

Capital expenditure during the report year was substantially below the determination (by £XXm or 40%). The underspend was in all areas but most notably in MNI (down by £XXm). Section 4.2.3 of the Board Overview comments that:

“The spend in the report year was low compared with average spend in the AMP4 period, and significantly less than planned due to a slow start as spend was prioritised following the final determination, and due to a delayed start on phase 2 of the uprating and refurbishment of Reservoir A WTW. This did not affect non-infrastructure serviceability in the report year and the underspend will be redressed over the remainder of the AMP5 period”.

The delayed start to Reservoir A WTW phase 2 had a modest impact as work was progressing during the year on the delayed Reservoir A WTW phase1 although the Company comments that this was mainly at the Contractor’s expense. The Company anticipated the slow start by setting the capex budget for the year significantly below the determination. This seems to reflect a common practice across the regulated industry.

There was a £XXm underspend on IRE in the year with 18km of mains being replaced compared with the target of 27km/year in AMP5.

There was very little expenditure in the year on lead communication pipe replacements which is the only element of the quality capex programme.

The £XXm underspend on maintaining and improving the supply demand balance is partly related to the Reservoir A WTW delay (SDB component) and partly to the lower than expected addition of new properties and associated infrastructure. Capital contributions from Developers are also down by 50%.

Table 35B: Capex Variance from 2009 FD

No efficiency savings have been claimed at this stage in AMP5. All variances in Table 35B are related to different timing of expenditure (Block B).

The Company shows no expenditure in Block D (Lines 25 to 30) on 2005-10 outputs not included in the PR09 baseline. During the report year, the Company has been delivering Phase 1 of the Reservoir A WTW refurbishment which is split 80% base service and 20% SDB (refer to commentary on Table 32). The latter component (£XXk in the year) is a delayed AMP4 output (to provide a critical period SoSI of 100 at the end of AMP4) and should probably have been shown on Line 28 (maintaining supply demand balance).
The Company has also been completing the security enhancements to service reservoirs as required under the SEMD Advice Notes. The Company argues that this work was not funded under the SEMD programme (Quality enhancements) and is therefore being classified as base service non-infrastructure assets. There was approximately £XXk expenditure in the report year.

Table 37: Water Compliance Expenditure Report

In Year 1 of AMP5, the only capex related to quality relates to lead communication pipe replacement in response to failures of the lead standard at customer’s taps. Activity has been lower than expected because there have been fewer failures.

SEMD capex on outputs identified in the FBP is expected to commence in Year 2.

Opex relates to the National Environmental Programme (NEP) investigations for Reigate Heath and the Lower Greensand.

Table 42: Greenhouse Gas Accounting

The Company has used the current version of the UKWIR Greenhouse Gas Estimate (version 5) spreadsheet to prepare the figures for Table 42.

Automated Meter Reading (AMR) meters were installed during March 2010 for most of the Company’s profile class 5 to 8 electricity sites and for the Company’s natural gas supplies. These meters provide more accurate and reliable data compared to those used in previous years.

The Company’s method was reviewed and was found to be appropriate. However, the Reporter has reservations about the amount of detail included in the method statement. For example, there could be more specific details about how the source data is extracted and processed and what checks are made to ensure the figures entered into the UKWIR spreadsheet are correct. This was discussed with the Company and it stated that in its view the method statement had sufficient details to describe the procedures used for Table 42.
ANNEX A: GENERAL REPORT

A1 Terms of Reference

Mr J Wild, a Technical Director of Black & Veatch Ltd. (BVL), is the appointed Independent Reporter for Sutton and East Surrey Water (SSE). The date of appointment was December 2010 and extends for 5 years to December 2015, subject to an annual review or early termination.

The Reporting Team has studied specific sections of the June 2011 Return (JR11) as prepared by SSE and has followed a number of audit trails to establish the sources of information contained within that Return to assess its adequacy and accuracy.

The Reporting Team has received a very good level of co-operation and the Company has provided information requested and, in general, has acknowledged and commented on audit notes. A number of challenges (or audit issues) were raised during or following the audit meetings and are listed in Appendix B. Some of the issues were resolved prior to the preparation of this report but others remain unresolved.

JR11 has been completed generally in accordance with the June Return Reporting Requirements (issue 1.0 dated January 2011) as amended in April 2011.

The Terms of Reference for the Reporter are set out in the Agreement with SSE and in the Reporters Protocol (Issue 2 – March 2003). The services relate to the following Licence Conditions:

- Condition B - Charges
- Condition C - Infrastructure Charges
- Condition J - Levels of Service Information and Service Targets
- Condition L - Underground Asset Management Plan
- Condition M - Provision of Information to Ofwat

A draft Audit Plan was prepared in accordance with the guidance to Reporters for JR11 and submitted to the Company and to Ofwat in February 2011. The Reporter received confirmation of the ceiling cost on 17th March.

The role of the Reporter was described in general terms in Section 1 of the JR11 Reporting Requirements. Further detailed guidance was provided in Section 2, Chapters 1 to 42. The Reporter was asked to provide a single report for JR11 comprising by exception comments on the Board Overview, by exception comments on the Company tables, a general report and Levels of Service certification. There were specific exclusions from the JR11 audit, notably tables related to the Service Incentive Mechanism (SIM) and Health & Safety.

A2 Reporter’s Team

For JR11, the Reporter has carried out about 50% of the audit work in accordance with the audit plan. He has been supported by the Lead Auditor, Lance Wadeson who is a Chief Engineer at BVL.

A3 Audit Approach and Scope

The audit approach and the scope of work were described in the Audit Plan as follows:

*The main source documents for the audit work will be as follows:*
Ofwat feedback from JR10
Ofwat Reporter Workshop held in January 2011
Protocol for Reporters issued as MD185 on 31st March 2003
2011 June Return Reporting Requirements and Definitions Manual, Issue 1.0, dated January 2011 (to be updated in March 2011)
JR11 Final Reporter’s Requirements, Issue 1.0 dated January 2011
Information Notice IN 11/02 dated February 2011
Ofwat clarifications for JR11

There has been no company specific guidance for SES issued to the Reporter to date.

Information Notice IN 11/02 explained the broad philosophy for JR11 which is viewed as a stepping stone to lighter regulation and a risk-based approach to the audit process. Companies are to provide a Board Overview that focuses on material issues. Companies are not expected to provide individual table commentaries although they are to provide additional explanatory information if considered necessary.

Reporters are expected to examine company information and data in a similar way to previous years. For JR11, a single report is to be submitted to Ofwat setting out the material issues and changes in methodology that have been found during the audits. The report is also to focus on material issues and to comment, by exception, on changes that have not been highlighted by the Company or where Company explanations require further clarification. Individual table commentaries are not required.

Audits will be conducted by the Reporter and audit team in meetings with key SES personnel (identified in Appendix B), by subsequent telephone / fax / e-mail contact, by detailed examination of records provided in the course of the audits and by discussions with other SES staff or their Consultants, as appropriate. It is recognized that the audit schedule provided in Appendix B will need to be flexible to match the actual Company preparation of tables and draft commentaries.

The duties of the Reporter may be summarised as follows:

• Ensure that Company’s assumptions, methods and procedures are adequate and are being followed in preparation of JR11 information;
• Ensure that there are coherent links with earlier submissions;
• Ensure that the methods and procedures are adequate for producing estimates of expenditure needs or records of costs incurred;
• Ensure that the methods and procedures provide a credible system of quality assurance;
• Check that the Company has complied with the guidance or has explained why the guidance has not been followed;
• Check that the Company has explained where the methodology has changed from the previous year and identify any changes that the Company has not highlighted;
• Report by exception;
• Comment on Confidence Grades provided in the ICS where the Reporter feels the grade is inappropriate.

The depth of the audits will be tailored to meet specific requirements. Where necessary, checks will be carried out that systems are providing reasonable answers, the methodology is sound and meets Ofwat’s requirements and that the basic data are robust. In-depth audit trails will be carried out on selected data samples, or schemes, to establish an audit trail from basic information through to final entry on the JR11 table. For example, sample projects will be selected to check the Company procedures for allocation of capital expenditure in Tables 32, 35 and 37.
A summary note on each audit will be prepared. This “Audit Note” will briefly set out the audit work undertaken, highlight any follow-up actions required by the Reporter or by the Company and also highlight any substantive issues (or challenges) identified during the audit. The Audit Notes anticipate feedback from the Company in the form of additional information, corrections to any mis-understandings and explanations of the Company’s stance in the case of a challenge.

No company specific guidance was subsequently issued by Ofwat. Some minor amendments were made to the Company and Reporter guidance in April 2011 and were incorporated into the approach.

A4 Meetings with Company

A full list of the audit meetings is provided in Appendix A to this report. Meetings were held in the SES office in Redhill with the relevant data providers, usually at their desks so that systems and spreadsheets could be viewed on screen. Where appropriate, discussions were held with other staff responsible for carrying out the work or assembling the data for JR11. Copies of key spreadsheets were provided for subsequent review.

The Reporter had a discussion with the Managing Director on 31st May and attended a meeting of the Audit Committee on 1st June to comment on audit findings to date. The issues relating to SoSi and the water balance / leakage were discussed.

Some early audit meetings were carried out in April, but most of the meetings took place in May and early June. A draft copy of the Board Overview was provided on 8th June and a final version following submission on 10th June.

A5 Analysis of time spent by Reporter and Team Members

The Reporter’s team has provided the inputs on JR11 that are broadly consistent with the audit plan target provided to Ofwat and are lower than the agreed ceiling.

A6 Costs of Reporter Activity

The costs of Reporter Activity on JR11 are similarly lower than the ceiling figure provided in Ofwat’s letter dated 17th March 2011.

A7 Levels of Service Methodology Statement

Companies are now not specifically required to submit a Levels of Service Methodology Statement so SES has not included one in its submission.

A8 Other Matters

There are no other matters that the Reporter wishes to draw to the attention of Ofwat.
## Appendix A: Summary of Audit Meetings

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Date</th>
<th>Description</th>
<th>SES staff</th>
<th>B&amp;V</th>
</tr>
</thead>
<tbody>
<tr>
<td>JR11 JW01</td>
<td>17/03/11</td>
<td>Capex: general</td>
<td>LS</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW02</td>
<td>18/04/11</td>
<td>Capex: general</td>
<td>GT</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW03</td>
<td>20/04/11</td>
<td>Table 10: leakage</td>
<td>RB, JD, LS</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW04</td>
<td>10/05/11</td>
<td>Table 7: properties and population</td>
<td>LS</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW05</td>
<td>11/05/11</td>
<td>Capex: Tables 32, 35 and 35A</td>
<td>GT</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW06</td>
<td>12/05/11</td>
<td>Table 10: water balance</td>
<td>RB, JD, MH, NH, LT</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW07</td>
<td>17/05/11</td>
<td>Table 1: water efficiency</td>
<td>AM</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW08</td>
<td>25/05/11</td>
<td>MEAV revaluation</td>
<td>BH</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW09</td>
<td>25/05/11</td>
<td>Table 10a: SoSI</td>
<td>LS</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW10</td>
<td>01/06/11</td>
<td>Table 10: trunk main, reservoir leakage and uPCC</td>
<td>RB, JH</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW11</td>
<td>01/06/11</td>
<td>Audit Committee</td>
<td>Various</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW12</td>
<td>02/06/11</td>
<td>Tables 25a, 25c, 33 and 34</td>
<td>BH</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 JW13</td>
<td>06/06/11</td>
<td>Table 10: uPCC from DMA and PMA</td>
<td>JW</td>
<td>JW</td>
</tr>
<tr>
<td>JR11 LW01</td>
<td>21/02/11</td>
<td>Handover from previous Reporter (Alastair J Elder)</td>
<td>AJE</td>
<td>JW/LW</td>
</tr>
<tr>
<td>JR11 LW02</td>
<td>22/03/11</td>
<td>Table 42: Greenhouse gas accounting</td>
<td>AW</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW03</td>
<td>24/03/11</td>
<td>Tables 2, 5-DG8 only, 6, 8, 11, 11a and 12</td>
<td>RB, JD, NH</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW04</td>
<td>09/05/11</td>
<td>Tables 21, 21a and 21b CCA</td>
<td>BH</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW05</td>
<td>10/05/11</td>
<td>Table 6B Applications for vulnerable customers</td>
<td>BK</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW06</td>
<td>10/05/11</td>
<td>Table 11A Lines 1 to 5: turbidity</td>
<td>RB</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW07</td>
<td>13/05/11</td>
<td>Table 5: DG8 exclusions</td>
<td>BK</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW08</td>
<td>13/05/11</td>
<td>Table 8 – Household meter installations</td>
<td>JW, PM</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW09</td>
<td>13/05/11</td>
<td>Table 11: Line 13: no. of household meters renewed in year</td>
<td>JW</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW10</td>
<td>13/05/11</td>
<td>Table 8: Lines 7 and 8: water demand of recently metered properties</td>
<td>JH</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW11</td>
<td>19/05/11</td>
<td>Table 42: Greenhouse gas accounting</td>
<td>AW</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW12</td>
<td>02/06/11</td>
<td>Table 2 – DG3 Supply Interruptions</td>
<td>RB</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW13</td>
<td>03/06/11</td>
<td>Tables 21, 21a and 21b</td>
<td>BH</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW14</td>
<td>07/06/11</td>
<td>Table 4 - DG6</td>
<td>NH</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW15</td>
<td>07/06/11</td>
<td>Table 2 – DG2 Low pressure</td>
<td>RB</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW16</td>
<td>07/06/11</td>
<td>Table 5, Line 17 Special assistance register</td>
<td>RB</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW17</td>
<td>09/06/11</td>
<td>Table 6 – GSS</td>
<td>RB</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW18</td>
<td>09/06/11</td>
<td>Table 11 – Asset balance and distribution studies</td>
<td>RB</td>
<td>LW</td>
</tr>
<tr>
<td>JR11 LW19</td>
<td>09/06/11</td>
<td>Table 12 – Source types, pumping, no. of works, potable mains</td>
<td>RB</td>
<td>LW</td>
</tr>
</tbody>
</table>

### SES
- **AM**: Alison Murphy
- **AW**: Anthony Welch
- **BH**: Bev Heine
- **GT**: Gary Taylor
- **LT**: Laura Taylor
- **LS**: Lester Sonden
- **JH**: Jeremy Heath
- **JM**: Jeremy Downer
- **JS**: John Wild
- **LK**: Lesley Kolb
- **MA**: Mike Hegarty
- **NH**: Nigel Hammond
- **PM**: Paula Melhuish
- **RB**: Rob Baldry
- **WA**: Laura Taylor
- **WL**: Lance Wadeson
- ** Others**: Alastair Elder

### Reporting Team
- **AM**: Alison Murphy (Jacobs)
### Appendix B: Summary of Audit Concerns

The following table lists the areas of concern or challenge raised during the audit meetings and whether the Company’s concern was resolved.

<table>
<thead>
<tr>
<th>Meeting ref.</th>
<th>Table</th>
<th>Area of concern / challenge</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>JR11_JW03</td>
<td>10: water balance</td>
<td>The SES approach to Table 10 assumes the residual in the water balance is unmeasured household consumption. This is not aligned with best practice which would comprise basing unmeasured domestic on the domestic consumption monitor, assuming the residual in the water balance is leakage, comparing this with the bottom-up estimate of leakage and applying an MLE adjustment to the overall balance, if appropriate. It is recognised that Ofwat wants an estimate of leakage that is consistent with the approach used for target setting but the Company should consider improvements for the next Business Plan.</td>
<td>Resolved: The SES response is attached as Annex C to this report. It refers to good or common practice rather than best practice. The Company has agreed to review the approach to the water balance for PR14.</td>
</tr>
</tbody>
</table>
| JR11_JW03   | 10: leakage   | SES does not take account of the summer months for the calculation of annual leakage. Periods excluded in the last three years were:  
- 2008-09: excluded part June, most July, most August and part September (approx. 3 months)  
- 2009-10: excluded part June, most July, part August, most September (approx. 3 months)  
- 2010-11: excluded part April, most of May to September (approx. 5.5 months)  
In the Reporter’s view, the averaging across the summer months is not aligned with best practice. The Reporter is not aware of any other Company that takes this approach or of any publication (e.g. UKWIR) that advocates this type of approach as best practice. The variation of the period excluded represents a change from JR09 and JR10. Company asked to provide alternative leakage estimates for JR11 using the same exclusion period as JR09 and JR10. | Unresolved: The SES response is attached as Annex C to this report. The Company says two other companies uses summer averaging and that it is supported by the UKWIR document on best practice for unmeasured domestic consumption monitor. The Company considers that the approach is consistent with target setting as the approach is consistent even though there is significant variation in the length of the summer averaging period. |
<p>| JR11_JW05   | 32 and 35: capex | The work on reservoir security covers (overhang from AMP4) should be classified as SEMD not MNI | Resolved: SES confirms that the work was not funded under the SEMD programme and therefore should be classified as MNI |
| JR11_JW05   | 32 and 35: capex | Check whether the work on the sailing club at Reservoir A WTW is core or non-core business | Resolved: SES confirms the work is core business |
| JR11_JW09   | Table 10A: SoSI | The Company has included Reservoir A WTW in the estimation of peak DO / WAFU for the report year on the basis that the work was substantially complete at the end of the report year. The peak week is most likely to occur over the period May to September and the work was not completed in summer 2010. Commissioning is in hand and the Reservoir A WTW should be able to provide the peak 45 Ml/d in summer 2011. | Unresolved: the Company considers that a snapshot on 31st March is appropriate even for peak and that the work was substantially complete on that date. |</p>
<table>
<thead>
<tr>
<th>Meeting ref.</th>
<th>Table</th>
<th>Area of concern / challenge</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>JR11_JW10</td>
<td>Table 10: leakage</td>
<td>The Company makes no allowance for service reservoir leakage in the estimation of bottom-up leakage. The Company makes no allowance for trunk main leakage in the estimation of bottom-up leakage other than for properties fed directly from the trunk mains.</td>
<td>Unresolved: Company considers that no service reservoir leakage is justified from reservoir inspections / drop tests and no trunk main leakage is justified from walking of trunk mains. Company will consider as part of leakage review.</td>
</tr>
<tr>
<td>JR11_JW12</td>
<td>Table 25C</td>
<td>The Company splits retail into household and non-household on the basis of customer numbers: Reporter queries whether this was appropriate when e.g. some non-household meters will be substantially larger than household meters.</td>
<td>Company considers basis of split to be appropriate and consistent with opex split.</td>
</tr>
<tr>
<td>JR11_JW13</td>
<td>Table 10: uPCC</td>
<td>The Small Meter Areas are equipped with Elster C4000 combination meters which are designed to meet Class C accuracy at low flows. The Company is assuming a meter under-registration for the SMAs in the range 2% to 14.5% with typical values of 7% to 10%. These were challenged as over-estimates.</td>
<td>Unresolved: Company commented that it was seeking further guidance on this.</td>
</tr>
<tr>
<td>JR11_LW05</td>
<td>Table 6b Vulnerable customers</td>
<td>WaterSure tariffs shown on website in May 2011 where still the 2010/11 tariffs and not the 2011/12 tariffs.</td>
<td>Resolved: Tariffs have been updated.</td>
</tr>
<tr>
<td>JR11_LW16</td>
<td>Table 5, Line 17</td>
<td>The figure reported for the Special Assistance Register (SAR) is the number of properties and not the number of consumers on the registered.</td>
<td>Unresolved: HiAffinity (SES's billing system) does not currently have the facility to individually record and report the number of consumers on the SAR.</td>
</tr>
<tr>
<td>JR11_LW17</td>
<td>Table 6: Customer service standards</td>
<td>The system for monitoring progress with customer appointments should not allow the status to be blank.</td>
<td>Resolved: SES have agreed to change the appointment system so that the default status is “Pending”.</td>
</tr>
<tr>
<td>JR11_LW18</td>
<td>Table 11, Line 4</td>
<td>A section of main has been included twice so Line 4 should be 10.79km instead of 13.45km.</td>
<td>Resolved: Company will correct the submitted version of Table 11.</td>
</tr>
</tbody>
</table>
ANNEX B: LEVELS OF SERVICE COMMENTS AND CERTIFICATION

LICENCE CONDITION J

LEVELS OF SERVICE INFORMATION CERTIFICATE

I refer to the documents dated 10th June 2011 prepared by Sutton & East Surrey Water (plc) as the June 2011 return to the Water Services Regulation Authority, which have been reviewed under my direction.

The June return, for which Sutton & East Surrey Water (plc) is solely responsible, includes Condition J (of the Instrument of Appointment) Levels of Service information.

In my professional opinion, based on and to the extent disclosed by sample monitoring carried out and as described in my Report to the Authority dated 17th June 2011:

1. The June return, in so far as it relates to Condition J Levels of Service information, has been properly compiled by Sutton & East Surrey Water (plc), and in accordance with reasonable methods and procedures which are adequate for providing information to the appropriate degree of accuracy and to enable the Authority to make a fair assessment of the company's performance against Levels of Service indicators; and

2. Subject to the qualifications expressed in my Report referred to above, the June 2011 Return, in so far as it relates to Condition J Levels of Service information, has been prepared in accordance with the methodologies described in the submission dated xx to the Authority and that these methodologies are adequate for the purpose of obtaining Levels of Service information in accordance with the relevant reporting requirements.

3. In reviewing information and materials for my report I was not required to review information and materials for the SIM.

Signed John Wild
For and on behalf of Black & Veatch Ltd.
Date 17/06/11
ANNEX C: COMPANY’S RESPONSE TO CHALLENGES ON WATER BALANCE AND LEAKAGE

The initial challenges on the Company’s approach to the water balance and leakage were raised in an audit on 20th April 2011 and formalised in an audit note (JW03). The Company was encouraged to provide a written response to the challenges. These were received on 8th June 2011 in the form of a short report prepared by Artesia Consulting which is incorporated into this Annex.

These initial challenges related to the methodology for the assessment of the overall water balance in Table 10 and the approach used for bottom-up leakage by excluding summer months and the variation of this period of exclusion from year to year. For JR11, this period of summer exclusion was 5.5 months.

In subsequent audits, further issues were raised with regard to:

- The robustness of the unmeasured per capita consumption estimates from both DMAs and the small area monitors (SMAs)
- The assumptions of no leakage from service reservoirs and from trunk mains (except for those properties fed directly from the trunk mains)

The first of these subsequent issues is addressed in part in the Artesia Report but the second issue is not discussed.

The Reporter’s observations and conclusions on the Artesia report are included in Section 8 of this report which lists the by exception comments on the Company’s tables.
SESW Table 10 and leakage 2010/11

Issues relating to summer leakage reporting and the water balance reconciliation

Ref: AR1045 – June 2011

Introduction

This paper addresses two issues that were raised by the Reporter during JR11, namely:

- The SESW approach to calculating the water balance.
- The method used to estimate leakage during the summer months.

Sutton and East Surrey Water asked Artesia Consulting to review these two issues and provide an expert opinion.

Best practice

Before addressing the two specific points, it is worth commenting that ‘best practice’ in terms of the water industry’s estimation of leakage is not well defined. There are a series of reports (most of which are referred to in the Reporter’s email), which set out a variety of approaches that can be used to calculate the estimate of leakage using a top down approach or a bottom-up approach. There is no single definition of ‘best practice’: different companies apply a variety of methods, probably best described as ‘good practice’, many of which are broadly common, but they do vary in detail.

For example one company may use a very detailed company derived value for legitimate household night use, but then use a single pressure adjustment factor across all the DMAs in the company; whereas another company (such as SESW) may use industry standard legitimate night use values but then use specific DMA derived pressure reduction factors for each DMA. Both are applying ‘good’ practices, but both are applying different elements of the UKWIR leakage ‘best’ practice methodologies; it is impossible to say whether either is right or wrong. The result being that if you gave each of the water companies the same basic 15 min flow data for a DMA, and asked them to calculate the leakage, there would be a spread of results.

One important issue is that whilst the methods may vary between companies, each company should apply their approach consistently over time from the base year (when the leakage target is set) through the AMP. Where companies change their leakage calculation methodology, there will (normally) be a step change in the reported leakage level (even though the volume of water escaping from the network does not change): STW, TW and Veolia Central have all done this over recent years. Therefore the impact of any change to the leakage calculation methodology needs to be quantified in the base year and intervening years, and on the ELI and leakage target before being implemented, and then normally after discussion and agreement with Ofgem.

It is therefore considered inappropriate to simply classify SESW’s methodology as not following ‘best practice’. Where there are divergences from ‘good’ or ‘common’ practices, these should be examined, and where a change in leakage calculation methodology is justified then the impacts of a change need to be quantified in terms of base year leakage and targets.
Summer leakage

Regarding the calculated leakage over the summer months, the Reporter commented that: “this approach (excluding summer months) was not aligned with best practice. JW is not aware of any other company that takes this approach or of any publication (e.g. UKWIR) that advocates this type of approach as best practice. Also, the variation of the period excluded represents a change from JR09 and JR10.”

The first point, that this approach is not aligned with best practice, cannot be justified. It is true that many companies simply take the summer nightline and assume that the increase that is seen during some summers is leakage, and make no direct allowance for increased night demand. However this situation may be taken into account in the adjustments made as part of their water balance calculation and the MLE approach. However at least two other water companies have for some time made adjustments for summer leakage on the basis that the increase in nightline is not solely due to an increase in leakage. These are: Southern Water¹ and Essex and Suffolk Water².

Additionally, the method is recommended in the UKWIR report: “Best practice for unmeasured PCC monitors”, 1999, 99/WM/08/25. It is recommended in the leakage calculation section, specifically in section 2.5.2 “General method for night leakage for any size area”. It states:

“If the night use during dry summer periods can be shown to increase from analysis of a year’s data then for summer periods (for example May to August or September), the data should be removed and replaced with the average of the daily data for the month before and the month after the gap (e.g. April and September or October). This leaves any increased night use during the summer in the consumption figure.”

The method that SESW adopt is to identify a point at the beginning of the summer where the nightlines from DMAs start to increase at the same time, indicating that the increase is likely to be from demand not an increase in leakage. Checks are made to ensure that the increase is not attributable to a change in ALC activity or burst breakout. At the end of the summer period a point is identified when the nightlines fall and level off, indicating that the increase in night demand has reduced to normal levels. An average of the leakage in the month before and the month after the summer period is calculated and a linear line drawn between the start of the summer and the end of the summer period to calculate the summer adjusted leakage. This method has been investigated by Tynemarch for the recent summer, and shown to be a robust approach to estimating the summer period during which night demand increases.

The method relies on identifying when night demand starts to increase in response to dry periods at the beginning of the summer and when night demand returns to normal at the end of the summer. Therefore the period for which leakage is excluded from the analysis will vary from year to year. This is entirely logical as the points at which night demand increases and decreases during the summer period will be influenced by the weather. It would be less consistent to use a fixed period year on year.

There is a suggestion that this approach could mask an increase in leakage during the summer from a summer related burst event from ground movement as the soil moisture deficit increases. However, the current understanding from the UKWIR Managing Seasonal Variations in Leakage report is that

¹ Personal conversation with Terry Keating, Southern Water, June 2011.
² NWL JR10 Commentary Public Domain Version, Table 10 pages 26-29.
the increases in summer bursts is linked with AC pipes, rather than iron pipes. Two graphs are shown below from that report (Figure 1), indicating that iron pipes show a significant increase in burst rate during the cold winter, whereas for AC pipes the significant increase in burst rate occurs during the summer. SESW have a very small proportion of AC pipe in their network (<0.8%).

![Figure 1](image.png)

**Figure 1** Monthly burst from CI and AC pipes (from UKWIR MSVI report).

The total burst repair data from SESW shows that during the period when leakage was adjusted for summer use, the repairs carried out in May and June are lower than the weeks immediately before and after the summer period, with the burst rate in July and August higher (see Figure 2).

![Figure 2](image.png)

**Figure 2** Adjusted leakage, unadjusted leakage and repairs for SESW 2010-11

As an average the burst rate for the period May to September is 22 bursts per month, compared with the pre summer period burst rate of 19 bursts per month and the post summer period burst rate of 27 bursts per month. The fact that unadjusted leakage is reducing through August to October without an increase in repairs in September and October suggests that there is not a backlog of leaks building up over the summer period. After taking into account the very low number of bursts occurring, the decreasing and increasing trend and the lack of any backlog of leaks it would appear unlikely that there is a significant increase in leakage during the summer period.
On balance the evidence reviewed suggests that there is an increase in night demand during the summer that is causing an increase in the minimum nightline. SESW’s method makes the assumption that the increase in nightline during the summer months is solely due to an increase in night demand. To use the alternative approach, i.e. to assume it is all leakage, would be illogical as there are clear examples of DMAs where the summer nightline is increasing due to demand. Theoretically it would be possible to quantify a seasonal change in legitimate night use at DMA level and use this in the minimum night flow leakage calculation, but then other factors would need to be included such as the change in pressure adjustment factor at those DMAs due to increased night demand. All things considered, given the scale of the issue, the solution used by SESW is pragmatic and consistent with the base year leakage calculations. This method used is also consistent with the method used to calculate summer leakage in the small area monitors used to estimate the unmeasured household demand.

In conclusion:

The method used by SESW to calculate leakage during the summer is a valid method described in the UKWIR reports. The method has been consistently applied over recent AMP periods, has been accepted as appropriate by previous Reporters and has been accepted by OFWAT when setting the Company’s SELL and the leakage target. The method has been applied consistently each year and is similar to a method used by at least one other water company.

It is recommended that this method should continue to be used for SESW’s leakage reporting.

Water balance

Regarding the method used by SESW to calculate the water balance, the Reporter commented that: “this approach is not considered best practice: best practice would comprise basing unmeasured domestic on the domestic consumption monitor, assuming the residual in the water balance is leakage, comparing this with the bottom-up estimate of leakage and applying an MLE adjustment to the overall balance, if appropriate.”

Bearing in mind the previous comments on ‘best practice’, I have reviewed a number of other company approaches to determine what is common practice. I have looked at IR 10 commentaries for AW, BWH, CW, BW, PW, STW, ESW, Veolia, and SW. All of these use a variation of the MLE approach outlined above. The detail of the top-down and bottom-up estimates varies, which could be significant when comparing companies. The method used by SESW is at variance with ‘common’ practice. However, importantly the method used by SESW has been consistently applied for over 4 AMP periods and has been accepted as appropriate by Reporters and OFWAT when setting the Company’s SELL and the leakage target and WRMP.

Regarding the water balance and the MLE Ofwat state5: “If any of the estimated components of the water balance are overstated then other components could be understated. For example, if the estimate of unmeasured household demand was too high it could mean that a false figure for leakage was reported. To overcome this type of problem we look to the companies to derive an independent figure for leakage by using the minimum night flow (after adjustments for use).

Due to the uncertainty of using estimated components we expect that there will not be a balance first time (ie, it is likely that the sum of the estimated components will not equal measured distribution input). In this instance our guidance to the companies allows the use of a statistical technique called maximum likelihood estimate (MLE). This distributes the imbalance (up to a maximum of 5% of distribution input) across all the water balance components by reference to the size and the uncertainty surrounding each component. Not all companies adopt MLE, but instead allocate the imbalance to leakage using the minimum night flow estimate of leakage to check the accuracy of the leakage level reported.

Ofwat go on to say that they “look to companies to use the integrated flow/water balance method, and ask them to reconcile the results with those obtained from using minimum night flows. Where companies find a difference between leakage calculated by the minimum night flow method and the integrated flow method of more than around 5%, the latter approach to calculating leakage should be used”, i.e. if the difference is greater than 5% the top down estimate of leakage should be used.

As mentioned earlier, the approach that SESW use is different to the above. SESW calculate the following water balance components and treat them as known volumes:

- Billed Measured Household Use
- Billed Measured Non-Household Use
- Billed Unmeasured Non-Household Use
- Water Taken Unbilled
- Distribution System Operational Use.

That leaves ‘total leakage’ and ‘billed unmeasured household use’ as the two remaining components in the water balance. SESW calculate the ‘total leakage’ using the minimum night flow method and treat this as a known volume. The known components are then summed and subtracted from the measured distribution input volume to leave a residual volume which is allocated to the unknown component, in this case ‘billed unmeasured household use’. SESW have an ‘unmeasured’ per capita consumption (UPCC) monitor, consisting of 66 DMAs. For many years SESW have selected data from these DMA to provide verification of the PCC figure. However this method would not be suitable for use in the top down water balance calculation. The PCC value derived is used as an estimate for ‘unmeasured household use’ and compared with the figure from the top down/bottom-up water balance reconciliation. SESW also have an estimate of the unmeasured PCC from their unmeasured household consumption monitors; in the form of small area monitors (SAM), but this monitor is not fully commissioned.

Applying this method results in the water balance for 2010-11 shown in Table 1.

The ‘unknown’ volume (unmeasured household consumption) is highlighted in orange and has been adjusted to reconcile the water balance. The figure of 81.20 Ml/d equates to a PCC of 484 l/prop/day. Although considered inappropriate for a top down approach, the equivalent figure from the UPCC monitor for 2010/11 is 427 l/prop/day and from the SAM is 452 l/prop/day. Both of the monitors have a lower PCC than the figure derived from the top down estimate. Although there is clearly a difference between unmeasured household consumption and the figures derived from the SAM; as detailed later this is likely to be due to the present deficiencies in the SAM. It is reported by SESW that this is the first year that this method has not balanced and the UPCC failed to provide a good correlation between the predicted and actual consumptions.
### Table 1 Water balance for 2010/11

<table>
<thead>
<tr>
<th>Ref</th>
<th>Water Balance Component</th>
<th>Unit</th>
<th>Pre-MLE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measured Household Consumption</td>
<td>M/d</td>
<td>29.02</td>
</tr>
<tr>
<td></td>
<td>Measured Household SP losses (Internal)</td>
<td>M/d</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>Measured Household SP losses (External)</td>
<td>M/d</td>
<td>1.72</td>
</tr>
<tr>
<td>T10.1</td>
<td>Billed Measured Household</td>
<td>M/d</td>
<td>30.86</td>
</tr>
<tr>
<td></td>
<td>Measured Non-Household Consumption</td>
<td>M/d</td>
<td>25.80</td>
</tr>
<tr>
<td></td>
<td>Billed Measured Non-Household</td>
<td>M/d</td>
<td>26.07</td>
</tr>
<tr>
<td>T10.3</td>
<td>Billed Measured</td>
<td>M/d</td>
<td>56.92</td>
</tr>
<tr>
<td></td>
<td>Unmeasured Household Consumption</td>
<td>M/d</td>
<td>82.20</td>
</tr>
<tr>
<td></td>
<td>Unmeasured Household SP losses</td>
<td>M/d</td>
<td>6.71</td>
</tr>
<tr>
<td>T10.4</td>
<td>Billed Unmeasured Households</td>
<td>M/d</td>
<td>87.91</td>
</tr>
<tr>
<td></td>
<td>Unmeasured Non-Household Consumption</td>
<td>M/d</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td>Unmeasured Non-Household SP losses</td>
<td>M/d</td>
<td>0.08</td>
</tr>
<tr>
<td>T10.5</td>
<td>Billed Unmeasured Non-Household</td>
<td>M/d</td>
<td>0.95</td>
</tr>
<tr>
<td>T10.6</td>
<td>Billed Unmeasured</td>
<td>M/d</td>
<td>88.87</td>
</tr>
<tr>
<td></td>
<td>Void Properties SP losses</td>
<td>M/d</td>
<td>0.20</td>
</tr>
<tr>
<td>T10.21</td>
<td>Water Taken Legally Unbilled</td>
<td>M/d</td>
<td>0.43</td>
</tr>
<tr>
<td>T10.22</td>
<td>Water Taken Illegally Unbilled</td>
<td>M/d</td>
<td>0.00</td>
</tr>
<tr>
<td>T10.23</td>
<td>Water Taken Unbilled</td>
<td>M/d</td>
<td>0.43</td>
</tr>
<tr>
<td>T10.24</td>
<td>Water Delivered</td>
<td></td>
<td>146.22</td>
</tr>
<tr>
<td>T10.20</td>
<td>Distribution System Operational Use</td>
<td>M/d</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Distribution Losses</td>
<td>M/d</td>
<td>15.40</td>
</tr>
<tr>
<td>T10.29</td>
<td>Total Leakage (pro MLE from MNF method)</td>
<td>M/d</td>
<td>24.87</td>
</tr>
<tr>
<td>T10.30</td>
<td>Distribution Input (Sum of components)</td>
<td>M/d</td>
<td>161.85</td>
</tr>
<tr>
<td></td>
<td>Measured Distribution Input</td>
<td>M/d</td>
<td>161.85</td>
</tr>
</tbody>
</table>

Most companies now have in place an ‘unmeasured household consumption’ monitor (either a small area monitor or an individual property monitor) and use this in the water balance along with their estimate of leakage derived from the minimum night flow and then apply the MLE method. The MLE methodology recognises that there is uncertainty associated with each of the components and the method re-assigns any difference that exists between the water balance estimation of total leakage from distribution input (top-down) and the estimate of leakage from the analysis of minimum night flows (MNF) from DMAs (bottom-up). Where a difference exists it redistributes the difference between all of the water balance components based on the component errors associated with each component.

If we take the value for the unmeasured household consumption from the small area monitor for 2010/11 of 452 l/prop/day and put this in the water balance and apply the MLE method (with assumptions for the uncertainties for each component) we get the results shown in Table 2.

In the example in Table 2 the assumption has been made that the uncertainty in the unmeasured household consumption is 30%, which is greater than the uncertainty in the minimum night flow method of leakage of 10%. The result is that the difference in the top-down bottom reconciliation is mostly redistributed across the unmeasured household consumption, measured distribution input and leakage. The final leakage figure then becomes 24.87 Ml/d compared to the original 24.5 Ml/d.
Table 2 Water balance for 2010/11 with example MLE calculation

<table>
<thead>
<tr>
<th>Ref</th>
<th>Water Balance Component</th>
<th>Unit</th>
<th>Pre-MLE</th>
<th>Component Errors</th>
<th>Component Errors MLE</th>
<th>Stage of total</th>
<th>Adjustments</th>
<th>MIO</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured Household Consumption</td>
<td>M/d</td>
<td>29.02</td>
<td>3%</td>
<td>1.45%</td>
<td>3.97%</td>
<td>0.21%</td>
<td>29.23%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measured Household SP losses (Internally Measured)</td>
<td>M/d</td>
<td>0.11</td>
<td>15%</td>
<td>0.01%</td>
<td>0.03%</td>
<td>0.00%</td>
<td>0.13%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measured Household SP losses (Externally Measured)</td>
<td>M/d</td>
<td>1.72</td>
<td>12%</td>
<td>0.17%</td>
<td>0.47%</td>
<td>0.01%</td>
<td>1.74%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T10.1 Billed Measured Household</td>
<td>M/d</td>
<td>30.86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measured Non-Household Consumption</td>
<td>M/d</td>
<td>25.38</td>
<td>5%</td>
<td>1.29%</td>
<td>3.53%</td>
<td>0.17%</td>
<td>25.59%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Billed Measured Non-Household SP losses</td>
<td>M/d</td>
<td>0.27</td>
<td>12%</td>
<td>0.03%</td>
<td>0.07%</td>
<td>0.00%</td>
<td>0.27%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T10.2 Billed Measured Non-Household</td>
<td>M/d</td>
<td>26.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T10.3 Billed Measured</td>
<td>M/d</td>
<td>26.27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmeasured household or losses</td>
<td>M/d</td>
<td>79.41</td>
<td>80%</td>
<td>27.74%</td>
<td>62.36%</td>
<td>1.86%</td>
<td>79.17%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Billed Unmeasured Household</td>
<td>M/d</td>
<td>8.77</td>
<td>20%</td>
<td>0.67%</td>
<td>1.84%</td>
<td>0.10%</td>
<td>8.84%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmeasured Non-Household Consumption</td>
<td>M/d</td>
<td>0.87</td>
<td>25%</td>
<td>0.22%</td>
<td>0.60%</td>
<td>0.01%</td>
<td>0.88%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unmeasured Non-Household SP losses</td>
<td>M/d</td>
<td>0.08</td>
<td>25%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.08%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T10.5 Billed Unmeasured Non-Household</td>
<td>M/d</td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>T11.4 Billed Investment</td>
<td>M/d</td>
<td>93.41</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Void Properties SP losses</td>
<td>M/d</td>
<td>2.53</td>
<td>15%</td>
<td>0.05%</td>
<td>0.66%</td>
<td>0.00%</td>
<td>2.54%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T12.11 Water Taken Legally Unbilled</td>
<td>M/d</td>
<td>0.43</td>
<td>50%</td>
<td>0.22%</td>
<td>0.50%</td>
<td>0.02%</td>
<td>0.44%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T12.12 Water Taken Illegally Unbilled</td>
<td>M/d</td>
<td>0.44</td>
<td>50%</td>
<td>0.22%</td>
<td>0.50%</td>
<td>0.02%</td>
<td>0.44%</td>
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</tr>
<tr>
<td>T12.13 Water Taken Legally billed</td>
<td>M/d</td>
<td>6.88</td>
<td>50%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>6.88%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T12.14 Water Taken Unbilled</td>
<td>M/d</td>
<td>0.83</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>T12.26 Water Delivered</td>
<td>M/d</td>
<td>184.85</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>T12.29 Distribution System - Operational Use</td>
<td>M/d</td>
<td>55.80</td>
<td>59%</td>
<td>1.54%</td>
<td>4.17%</td>
<td>0.33%</td>
<td>54.83%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T12.29 Distribution Losses</td>
<td>M/d</td>
<td>15.80</td>
<td>15%</td>
<td>1.54%</td>
<td>4.17%</td>
<td>0.33%</td>
<td>15.43%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T10.29 Total Leakage</td>
<td>M/d</td>
<td>161.65</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference in Units of components</td>
<td>M/d</td>
<td>158.45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>M/d</td>
<td>3.29</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

For SESW to use the MLE methodology, SESW would need to make more robust estimates of the component errors, and improve the robustness of the small area monitor. The small area monitor needs improvement in the following areas:

- Checking that the sample of properties matches the demographics of the company and is sized to ensure that the levels of uncertainty are appropriate.
- The method of calculating the unmeasured domestic use from the SAM needs refining, two specific issues identified are the allowances used for legitimate night use and the treatment of meter under-registration.
- A valid statistical method for extrapolating the data from the SAM to company level needs defining.

The result of changing the leakage calculation method would result in a different level of leakage being reported, even though there is no change to the volume of water leaking from the mains network. Because the current leakage target has been set using the existing leakage calculation method, it would be necessary to quantify the impact of the change in leakage calculation method on the:

- Base year leakage
- Economic level of leakage or SELL (currently 27.3 Ml/d)
- Leakage target set by Ofwat (currently 24.5 Ml/d).

It is likely that all three of these would change, and it is possible that the new reported level of leakage would remain within the revised target that would need to be agreed with Ofwat.
In conclusion:

The method used by SESW has been consistently applied over recent AMP periods and has been accepted as appropriate by previous Reporters. It was also accepted by OFWAT when determining both the Company’s SELL and the leakage target.

The two approaches used by SESW to estimate unmeasured household consumption do not follow good practice, although the SAM approach could meet the good practice criteria when fully commissioned.

SESW should investigate making improvements to the SAM to produce a more robust figure for unmeasured domestic consumption and then applying the MLE methodology to derive the water balance.

It is recognised that currently the Ofwat leakage target (24.5ML/d) is set at a level that is about 10% below the current SELL (27.3 ML/d).

Before changing the leakage calculation methodology the full implications on the base year, SELL and leakage target levels should be quantified in terms of the impact on reported leakage levels and in terms of the overall cost benefit.

Dene Marshallsay, Artesia Consulting Ltd
8 June 2011