CAMBRIDGE WATER COMPANY

Beal Consultants

Review of SELL Modelling

Report prepared for
Cambridge Water

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Executive Summary

This report presents details of a review of the Sustainable Economic Level of Leakage (SELL) modelling undertaken by Cambridge Water.

Over recent years the company has used the WRc APLE model to undertake the assessment, but the latest assessment has been based on a bespoke model developed by South Staffordshire Water. This model uses the same basic principles as applied within the APLE model, but takes a more practical view of how leakage could be reduced by ALC teams reducing leak run-times.

We have reviewed the application of the model to Cambridge Water data and consider that the approach provides a robust estimate of the SELL.

The modelling indicates the short-run SELL is 15.5 Ml/d, which is 3.1 Ml/d above the current level of leakage. The model suggests that moving to the SELL would save £133k/yr on ALC costs, but lead to £81k/yr of additional costs from lost water. However, these savings would only be short-term, as the company would need to reduce leakage in the future to meet any increase in customer demand.

The assessment indicates that the company is currently operating significantly below the SELL, so it has not considered alternative leakage management options as part of the SELL assessment. For completeness the company may wish to consider the costs/benefits of alternative leakage management options such as pressure management, DMA re-configuration and mains renewal during its preparation of the water resources management plan.

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1. INTRODUCTION

The Sustainable Economic Level of Leakage (SELL) is derived using the following five elements:

i. Policy Minimum Level of Leakage

ii. Relationship between the cost of ALC (and repairs) and the level of leakage, including an assessment of the current costs and level of leakage

iii. Marginal cost of Water

iv. External costs and benefits (Environmental and Social)

v. Impact of alternative leakage management options

Over recent years Cambridge Water has used the WRc APLE model to undertake the assessment, but the latest assessment has been based on a bespoke model developed by South Staffordshire Water. This model uses the same basic principles as applied within the APLE model, but takes a more practical view of how leakage could be reduced by ALC teams reducing leak run-times.

This report presents details of a review of the SELL modelling undertaken by the company in February/March 2013.

2. AUDIT SCOPE

A review of the SELL spreadsheet and supporting calculations was undertaken during a working session in Cambridge Water offices, supplemented by exchanges of e-mails to clarify any issues identified. However, a full audit of each number/calculation was not undertaken.

3. DETAILED COMMENTS

3.1 Policy Minimum Level of Leakage

As companies reduce leakage the policy minimum level of leakage is generally accepted to be one of the most significant components of the SELL. Cambridge Water has used a robust approach, drawing on both company data and UKWIR approaches to provide an appropriate estimate.

The sum of the minimum achieved in each DMA is 8.09 Ml/d, whereas using the UKWIR method to estimate the minimum gives 9.62 Ml/d (average condition) and 4.73 Ml/d (good condition). All three estimates include appropriate allowances for meter accuracy, night use and leakage outside of DMAs.

The approach taken by the company considers each DMA, taking the appropriate estimate, either minimum achieved or the UKWIR estimate, which is then summed to give 7.19 Ml/d. We consider this estimate is robust.

3.2 Relationship between Costs and Level of Leakage

Leakage within Cambridge Water has remained stable throughout the base year, so it has been assumed that leaks have been repaired at the rate they have broken out, with no increase (or decrease) to the backlog, indicating the company is operating in Steady state.

Modelling the costs of operating at different levels of leakage has used the APLE model in previous updates to the SELL, however, for this update a model developed using the same principles by South Staffs Water has been used. This model also uses the concept of steady state, and varies the leak run-time by varying the level of ALC activity.

We reviewed the application of the new model to Cambridge Water, and verified the data had been entered correctly. Following a minor correction to one data input value (Reported leakage minus policy minimum leakage) we are confident that the model accurately estimates the relationship between costs and leakage for Cambridge Water.

3.3 Marginal Cost of Water

Within the SELL calculation the marginal cost of water (MCoW) is used to estimate the savings that would be achieved following a reduction in leakage. For past SELL calculations the company has used the average cost of the top six sources to estimate the MCoW. We consider this is a reasonable approach, since these top six sites represent approximately 10% of the company's distribution input.

We reviewed the calculations, and consider they are robust.

The SELL is therefore based on a MCoW of 7.13 p/m^3 (the average across all sites is 4.60 p/m^3).

3.4 External Costs and Benefits

Externalities have been included within the calculations for leakage management and the cost of leakage using the latest guidance "*Review of the calculation of sustainable economic level of leakage and its integration with water resource management planning*" published by Environment Agency, DEFRA and Ofwat in October 2012.

3.5 Alternative Leakage Management Options

The company is currently operating below SELL, so not has not considered alternative leakage management options as these would reduce leakage still further. We recommend, however, that for the final water resource management plan the company present some details of the costs and benefits of using pressure management, DMA re-configuration and mains renewal.

4. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations can be drawn from the analysis presented in this report:

- **Modelling approach:** We have reviewed the application of the model to Cambridge Water data and consider that the approach provides a robust estimate of the SELL.

- **Short-run SELL:** The modelling indicates the short-run SELL is 15.5 Ml/d, which is 3.1 Ml/d above the current level of leakage. The model suggests that moving to the SELL would save £133k/yr on ALC costs, but lead to £81k/yr of additional costs from lost water. However, these savings would only be short-term, as the company would need to reduce leakage in the future to meet any increase in customer demand.

- **Leakage Management Options:** The assessment indicates that the company is currently operating significantly below the SELL, so it has not considered alternative leakage management options as part of the SELL assessment. For completeness the company may wish to consider the costs/benefits of alternative leakage management options such as pressure management, DMA re-configuration and mains renewal during its preparation of the water resources management plan.