

Saving Water in the Hospitality Sector

A report for SEEDA under the BREW project • May 2008



Report written by Cath Hassell

With thanks to the following for the successful completion of this project:

El Bedlow, Farah Sharif, Jonathan Ferrie, Trevon Jervis, Matt Hassell (ech₂o), Chris Springett (BREW Centre), Richard Moore (Dart Valley Systems), Tim Clarke (SEEDA project manager), Eric Hassell, all the involved personnel at the partner Local Authorities (Aylesbury Vale District Council, Brighton and Hove City Council, Crawley Borough Council, Lewes District Council, Maidstone Borough Council, Medway Council, Reigate and Banstead Borough Council, West Sussex County Council), Southern Water and Sutton and East Surrey Water, and the managers at head office of the two chains we worked with.

With special thanks to the 10 premises in Cralwey who are fitted with data loggers which allows us to collect and analyse detailed information about how much water they use.

This report has been prepared to provide anonymity to all participating premises, apart from those accredited as best practice premises.

Technical Notes

On average in the UK it takes 1.2 kWh to supply 1m³ of potable water into a building and to treat the corresponding waste water. The DEFRA figure of 0.527 kgCO₂/kWh has been used to calculate CO₂ savings from water saved. These savings are for cold water only and do not take into account any CO₂ savings arising from not having to heat hot water, as most savings in this project were cold water.

Small water savings are shown in litres. Large water savings are shown in m³. There are 1000 litres in 1 m³ of water.

Project reference: SE 23848

© ech₂o May 2008



Contents

	Executive summary	4
1	Introduction to the project	5
2	Demand management measures	8
3	Review of the Saving Water in Crawley's Hospitality Sector project	11
4	Analysis of water efficiency measures	13
5.	Best practice premises	33
6.	Working with Local Authorities partners	39
7	Working with chains to become water efficient	52
8.	Conclusions	56

Executive Summary

- The “Saving Water in the Hospitality Sector” project” was funded by SEEDA as part of the BREW programme and was a follow up to the “Saving Water in Crawley’s Hospitality Sector” which ran from Dec 2006 to April 2007.
- This project’s main remits were to disseminate the knowledge gained to a series of Local Authority partners who could realise similar savings in their own hospitality sector, understand the issues around chains buying into water efficiency and to further analyse water efficiency measures using the 10 data logged premises in Crawley.
- The short time-scale of the project made it difficult for some Local Authorities and chains to be part of the project.
- Eight Local Authority partners, two water supply companies, and two chains operating in the hospitality sector engaged with the project. All partners suggested that results would have been better if the project had continued over a longer time span.
- Training delivered by ech₂o meant that the Local Authorities had the confidence to implement low-cost and zero-cost water efficiency measures within their hospitality sectors, without external support.
- Collected data about water use enabled the efficiency of various low-cost and zero-cost measures to be analysed.
- In some premises retrofitting urinal controls did not have as great an impact on water savings as had been calculated. After controls were fitted, water for urinal flushing decreased when the premises were shut but increased when the premises were open.
- Total water savings achieved from further water efficiency measures implemented by ech₂o in premises audited in 2006/07 are calculated to be 1140m³ per year.
- Total water savings achieved from water efficiency measures implemented by three Local Authority partners are calculated to be 922m³ per year.
- Total water savings achieved from water efficiency measures implemented by one chain are calculated to be 750m³ per year.
- Total water savings achieved under this project by April 2008 are calculated to be 2812m³ of water across 51 premises, an average saving of 55m³ of water per premises per year.
- Further high volumes of water savings are expected by end of March 2009 as a direct result of partners’ engagement in this project.
- The project funding should be extended to enable other Local Authorities to make comparable savings.
- **2812m³ of water saved is 3374 kWh of energy saved, resulting in 1687 kgCO₂ not emitted.**



1 Introduction to the project

- In 2006/07, as a direct response to the drought of summer 2006, ech₂o worked on a SEEDA funded project (Saving Water in Crawley's Hospitality Sector) to implement low-cost and zero-cost water efficiency measures in Crawley. Due to a combination of installing save-a-flush bags in 101 WC cisterns, fitting 21 urinal controls controlling 69 urinal spaces, adjusting excessive flow rates from taps in 30 premises and by identifying and rectifying major leaks, savings realised total 5,065m³ per year across 43 premises. Average savings per pub are 80m³ of water per year. Average savings per club are 686m³ of water per year. Average savings per restaurant are 22.8m³ of water per year.
- 5,065m³ of water saved is 6,078 kWh of energy saved resulting in 3,203 kg of CO₂ not emitted.

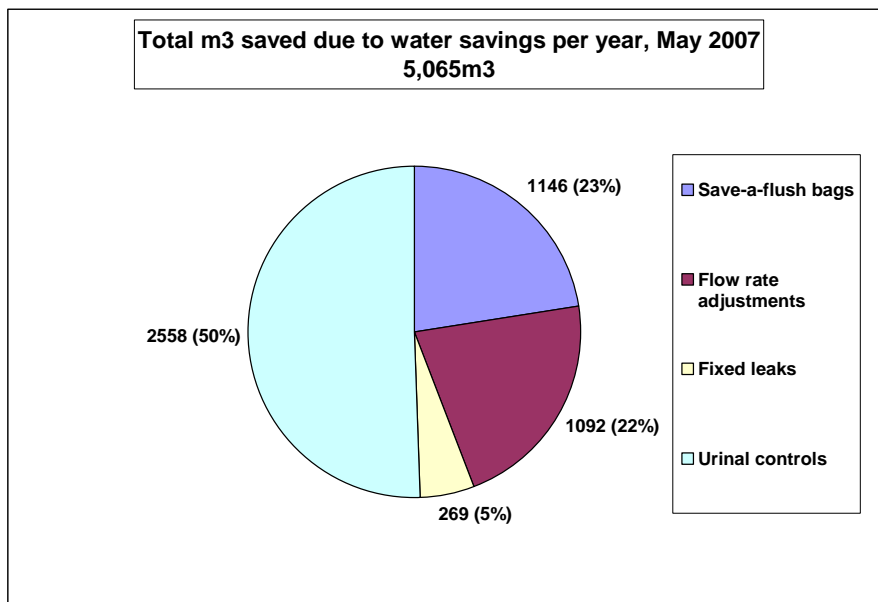


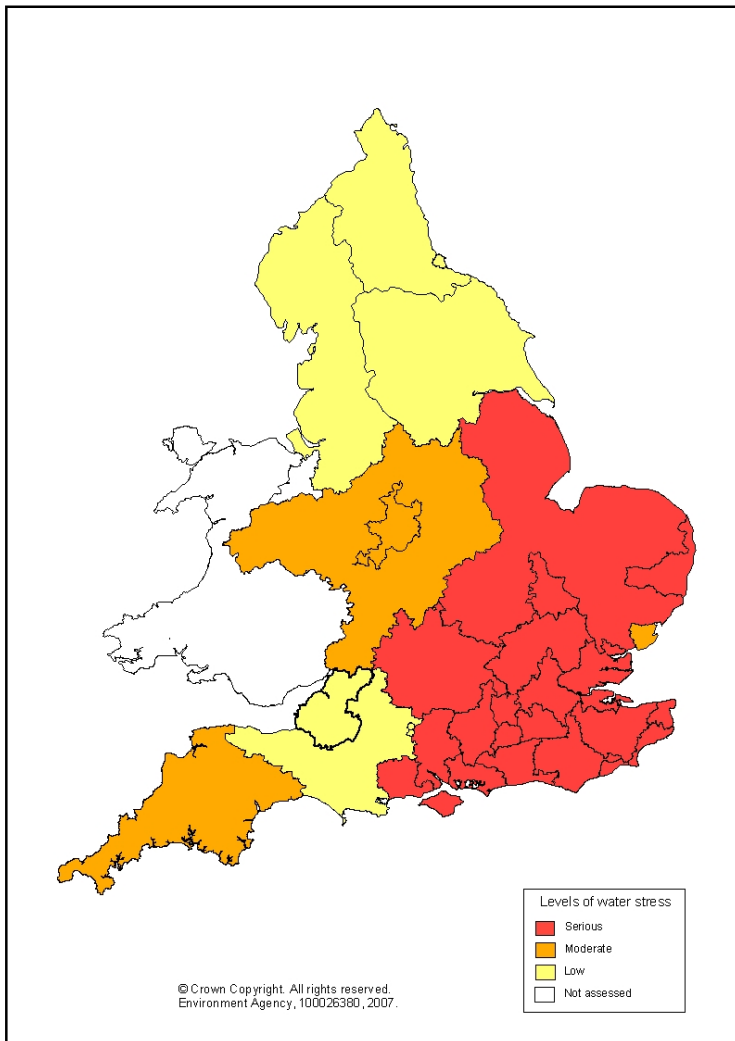
Figure 1.1

- This project was successfully completed in April 2007 and an in-depth report on the project can be downloaded from <http://www.ech2o.co.uk/pages/article.htm>
- As a follow up to the project SEEDA made available further funds in Nov 2007 to deliver five core outputs. They were:
 - to review the effectiveness of the 2006/07 Saving Water in Crawley's Hospitality Sector project.
 - to monitor the water use of the 10 Crawley businesses that had data logging systems fitted under the 2006/07 water efficiency project.
 - to develop 5 case studies from good examples of best practice low-cost and zero-cost measures generated from ech₂o's 2006/07 Saving Water in Crawley's Hospitality Sector project.

- to design and deliver a training package for Local Authorities to enable them to carry out water efficiency audits and implement low-cost and zero-cost water savings measures within SMEs in their areas.
- to research the issues of engagement in terms of obstacles to businesses / corporate chains from becoming water efficient.

1.1 Water in the South East

- The south east of England has been classified as suffering from severe levels of water stress by the Environment Agency. (See figure to left) During the drought of summer of 2006 hose pipe bans were in place across most of the south east and in some areas drought orders were applied for.
- The effect of global warming on the UK will increase the pressures on water supply in the south east as summer rainfall is expected to decrease by up to 30% by 2050. At the same time there will be increasing demand from the thousands of new homes designated for the south east.



- Savings must be made from all buildings, both new and existing, and from all sectors.
- There are 10 water supply companies operating across the south east. Only three companies provide sewage services. They are Anglian Water, Thames Water and Southern Water.
- The cost of water varies across the region. Volumetric costs (supply and sewage combined) range from £1.35 to £3.12. Thus monetary savings from water efficiency measures can vary by a factor of 2.3 depending on the area where installed.

Volumetric Charges for the South East Area 2008-2009. Water and Sewerage Combined	
COMPANY	£/m³
Anglian Water Services Ltd	£2.51
Essex and Suffolk Water (Essex)	£1.50
Essex and Suffolk Water (Suffolk)	£2.65
Folkestone and Dover Water Services Ltd	£2.90
Mid Kent	£2.60
Portsmouth Water	£2.22
South East Water (Zones 0) Mid Southern	£1.35
South East Water (Zones 1) Eastbourne	£3.05
South East Water (Zones 2) Mid Sussex	£3.12
South East Water (Zones 3) West Kent	£2.73
Southern Water	£2.29
Sutton and East Surrey Water plc (Southern area)	£1.55
Sutton and East Surrey Water plc (Northern area)	£1.32
Thames Water Utilities Ltd	£1.59
Three Valleys Water plc	£1.82

2 Demand Management Measures

- It is recognised that demand management has a critical role to play in managing water supply sustainably, and needs to be implemented into existing buildings as well as new buildings.
- A series of low-cost and zero-cost water efficiency measures to reduce water use were implemented during this project.

2.1 Reducing WC flush volumes

- Save-a-flush bags are cistern displacement devices. They are essentially bags of silicone gel. Within 24 hours of being immersed in water, the silicone swells, and the bag displaces 1 litre of water when the cistern refills. The result is a 1 litre saving in water per flush.



- Within the hospitality sector most WCs have a flush volume of 7.5 litres or 9 litres making them highly suitable for retrofit of save-a-flush bags.²
- On average, a busy pub or restaurant can save between 40 to 50m³ of water yearly by fitting save-a-flush bags.
- Most water companies will supply save-a-flush bags for free. Therefore for an initial outlay of zero and less than 10 minutes fitting time for most WCs, savings per £ spent are very high. To maximise the savings, bags should be fitted when other tasks are being carried out.

- As education is also an effective low cost measure, it is important to post signs to show water use is being reduced.
- There is a potential (however slight) for double flushing or fouling of WC pans to occur once a flush volume is reduced. It is especially important with public WCs that someone in each premises knows how to remove the bags (a two minute job), in case problems occur.



2.2 Controlling urinal flushing

- In Crawley 45% of flushing urinals surveyed had no controls or obsolete controls. If, as expected, this pattern is repeated across the hospitality sector, the potential for savings from this measure are very high.
- Fitting controls means that urinals do not flush when the premises are closed. Most pubs are open 12 hours a day, seven days a week, whereas restaurants and nightclubs are usually open for fewer hours. In a building that is closed 12 hours a day, two urinals, flushing at a rate of 7.5

litres per hour (maximum allowed under the Water Supply (Water Fittings) Regulations 1999) can save almost 66m³ of water a year if controlled.

- Retrofitting urinal controls can have a payback of less than 6 months. It is important they are maintained to ensure ongoing savings.

2.3 Reducing flow rates at taps



- If isolating valves are fitted in the supply line to taps they can be used to reduce flow rates. This is an extremely simple measure that has the potential to result in large savings. It is important to get agreement from the owner or duty manager on which flow rates to adjust and by how much.
- Flow rates can be reduced by 2-6 litres per minute depending on type of tap and original flow rate. Adjusting isolating valves in this way can lead to excess flow noise; if this happens the valves should be re-adjusted to their original position.
- Under a refurbishment situation flow regulators, brake taps or spray taps are recommended.



2.4 Identifying and rectifying leaks

- Leaks which would otherwise have gone undetected can be identified during an audit.
- Highlighting the amount of water that is being wasted and the weekly cost to the organisation makes it more likely that the repairs will be carried out.

2.5 Education

- Spreading the message of water efficiency is very important. We designed personal posters for each participating premises in the Crawley project, as well as a general poster. We wanted to link into the fact the project was mostly in pubs and clubs, hence the pint of mud logo.
- Auditing premises is time consuming and sometimes hard to arrange, but enables direct contact with staff and owners and the ability to spread the message, and is therefore a core part of education.



2.6 Encouragement not enforcement

- Persuasion rather than enforcement was seen as key. It is important to encourage water efficiency as this is likely to have long term effects and to be carried into other sectors (e.g. the home environment). Threatening premises with enforcement by notifying the relevant Water Supply Company was felt to be totally counter productive.

The South East is under water stress. Be Water Aware!

Reducing flow rates at basin taps can save 6 litres of water per hand wash in public toilets. The flow rates at these taps have been adjusted to save water.



Saving Water in Crawley's Hospitality Sector is run by ech₂o for Crawley Borough Council and funded by SEEDA. To find out more visit: www.ech2o.co.uk

 **SEEDA** SOUTH EAST ENGLAND DEVELOPMENT AGENCY
Working for England's World Class Region

 **CRAWLEY** COUNCIL
ENVIRONMENT UNIT

 **ech₂o**
consultants

3 Review of the Saving Water in Crawley's Hospitality Sector project

- The "Saving Water in Crawley's Hospitality Sector" project was funded by SEEDA as part of the BREW project. The project's main remit was to audit premises and to implement low-cost and zero-cost water efficiency measures within premises in Crawley's hospitality sector. It was designed to follow on from original water efficiency work undertaken by Crawley Council.



- Crawley is a town of 100,000 people in west Sussex with a significant rise during commercial hours. At times during the drought of summer 2006, Weirwood reservoir (which is the main supply for Crawley) had to be supplied with water pumped from Portsmouth Water's supply, such was the demand on the existing water supply resources.
- 43 premises within the hospitality sector in Crawley were audited in early 2007 by ech₂o, and various water efficiency measures were implemented.
- An in-depth report on the project can be downloaded from <http://www.ech2o.co.uk/pages/article.htm>
- In Dec 2007, to review how successful the initial project had been, all 43 premises were telephoned and asked to respond to a short survey.
- Specific questions were designed to ascertain:
 - how useful the written report had been,
 - whether water awareness had increased within the premises following ech₂o's visit,
 - whether any problems had been experienced from the low-cost and zero-cost water efficiency measures implemented,
 - and, if ech₂o had not been able to implement certain measures due to either no access or no permission granted, whether any of the recommended measures had been carried out.
- The owners or duty managers were also asked to make any other comments they wished.
- Most people remembered the visits and their replies were overwhelmingly positive.

3.1 How useful was the written report?

- The written report was perceived as being very important, especially the fact that it was individualised (even by those premises who hadn't acted on it!). Three premises commented that it would have been useful if the space between the audit itself and the report arriving was shorter.³

- The cost of recommended water saving devices in the report would have been helpful, as would follow up support and visits.⁴ One person responded that reminders via updates from local authorities would be useful to keep the issue in the mind.

3.2 Had water awareness increased following ech₂o's visit?

- Water awareness had increased in most premises. There had been a level of awareness before because of the drought, but it was recognised that it is important to reduce water even when not in a drought situation.⁵
- Most premises reported that staff were saving water on a personal and commercial level even though the report had gone to Head Office. This was a combination of meeting ech₂o personnel during the audits, and the signage about water efficiency. However, one publican commented that it was important to involve public/staff/frontline service staff and that was difficult

3.3 Had any problems had been experienced from the low-cost and zero-cost water efficiency measures implemented?

- No problems were reported with save-a-flush bags causing fouling of the public WCs due to insufficient flush volume. As many of the volume reduction had been from 7.5 to 6 litres, this was an excellent result. We had explained how to remove if double flushing or fouling of the pans started to occur. Studies by some of the water companies have shown that save-a-flush bags work well in domestic situations but we were not aware of trials in public situations
- Premises that had urinal controls fitted were pleased with the results. All controls were working well and no premises complained of smell problems. As controls were fitted pre the smoking ban and the survey was post the ban, we had been concerned that if urinals were now causing odour problems, the controls would be blamed. Some premises commented that the standard of hygiene was now better with the controls fitted.⁶
- No premises had readjusted the reduced flow rates. It is important to note we had always adjusted flow rates with the permission of the owner or duty manager.

3.4 Had any of the recommended measures had been carried out.

- Most premises had not carried out any of the water efficiency measures recommended. Those who hadn't carried out the measures, stressed cost as the major factor. As water is relatively cheap, (in Crawley businesses were paying just £1.24 per m³ in 2006/07) there were a few comments about it 'being more trouble than it's worth'. Some premises commented they would take the recommendations into account when updating the WCs in their entirety.
- In some premises there was a level of frustration with head office that recommendations by ech₂o seemed sensible and easy but had not been carried out.
- Overall there was still some scepticism about how much water (and therefore money) could actually be saved by fitting water efficient devices, if the cost needed to be borne by the premises themselves.

3.5 Conclusions

- This follow up survey confirmed our first survey that far better results are attained if the auditing body actually carries out the water efficiency measures while on site.

4. Analysis of water efficiency measures

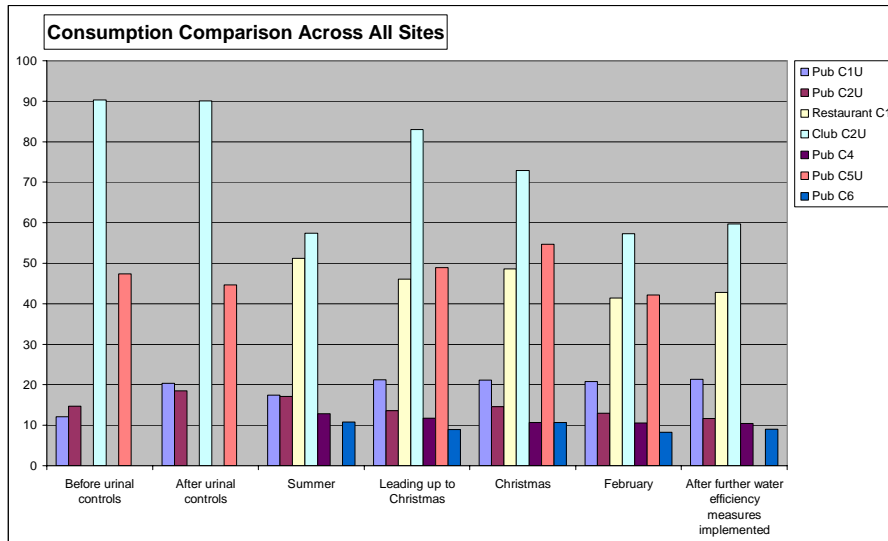
- A series of further low-cost and zero-cost water efficiency measures were implemented in the data logged premises during the second stage of the project. These differed between premises and are detailed in the analysis of each site. Measures implemented were one or more of the following:
 - adjusting flow rates at taps
 - reducing WC flush volumes
 - installing urinal controls
 - adjusting the timings on installed urinal controls
 - providing “Be Water Aware” signage.
- Reducing WC volumes by installing save-a-flush bags had been implemented at most of the premises before logging began. Flow rates at taps had been adjusted (where possible) in most of the premises before logging began. Urinal controls were fitted in 6 out of 10 premises after logging began.
- Savings from these measures were calculated using best-guess estimates of usage patterns and customer numbers as in the original project. Data from the loggers was subsequently analysed to see whether estimated figures were supported by actual readings.
- The data was inconclusive in showing actual savings from any particular measure. This was due to a variety of reasons including the following:
 - Calculating customer numbers and their length of stay is very difficult, especially in pubs where a customer can stay for 15 minutes for a swift half, or several hours with subsequent different effect on the amount of water used.
 - Customer numbers change throughout the day and are usually at the weekends.
 - Pubs with gardens are busier during the summer months than in winter, making weekly estimations difficult.
 - Even when numbers are available (e.g. in nightclubs and restaurants⁷) actual water savings of each efficiency measure was difficult to analyse as meters are reading total water use within the premises.

4.1 Data loggers

- Ten sites were fitted with data loggers during February 2007 under the Saving Water in Crawley’s Hospitality Sector project. All sites had initial problems of set up. Most sites started reliable monitoring by mid-March 2007 although inconsistent readings occurred beyond that time. This has caused some difficulty with the quality of average readings for some sites.⁸
- Premises had access to their own individual sites but did not access them regularly due to time constraints and the difficulty of logging onto the program.
- ech₂o and Crawley Council had access to data from all ten sites
- The program gives access to two sets of data. The first set comprises data download graphs showing the flow rate in litres per second as a series of spikes on a graph. Minimum, maximum and average flow rate in litres/second are detailed, as is total usage in m³.
-

- The second set of data is average daily consumption in m³. However this was only available up to May 2007. After that, the data was changed to show weekly consumption data only, which was far less useful for data analysis.⁹
- Data can be requested for any required period. We found that weekly data downloads (showing the pattern of use of flow rates) and daily consumption in m³ were the most useful way to access the data.
- The most useful information from the loggers was in looking at overall patterns of water usage and identifying unusual usage; most patterns of unusual use were leaks.
- Data was analysed 1 month after loggers fitted, then at various times throughout the year.
- On 31st March 2008 the complete data for each site was downloaded and the results are analysed below.

4.2 Overall analysis



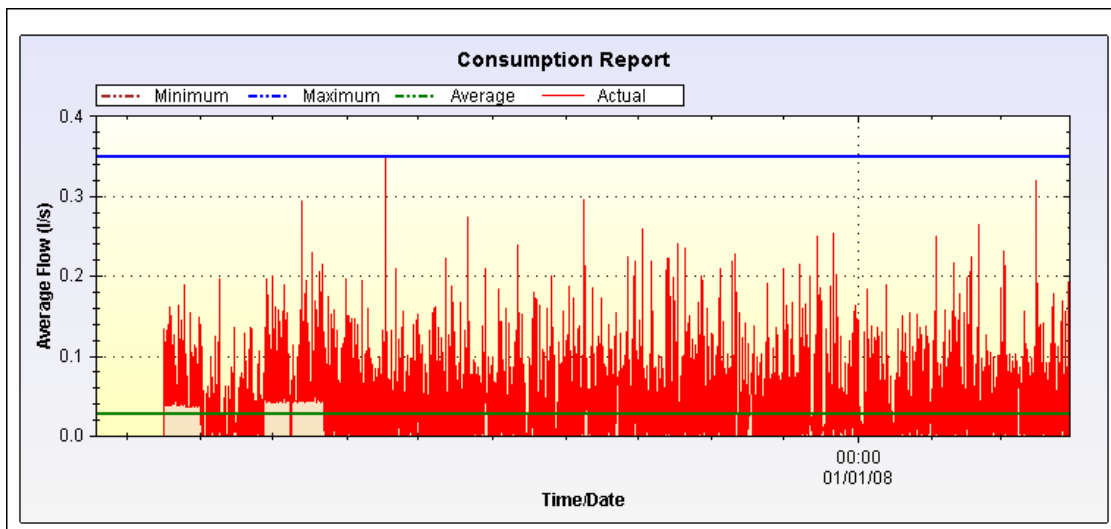
Water consumption per week at different stages of the project

- Reliable data was only collected from seven premises out of ten, and even then data was not always available from all seven sites all of the time. (For example, there is no data from Pub C5U before July and after January).
- We would have liked to analyse data monthly but due to gaps in data downloads, there was not enough information to make this work and therefore particular weeks were chosen.
- Snapshots of a weeks worth of actual consumption were taken from various stages over the project. The weeks chosen were:
 - a week before urinal controls were fitted
 - a week after urinal controls were fitted
 - a week in summer

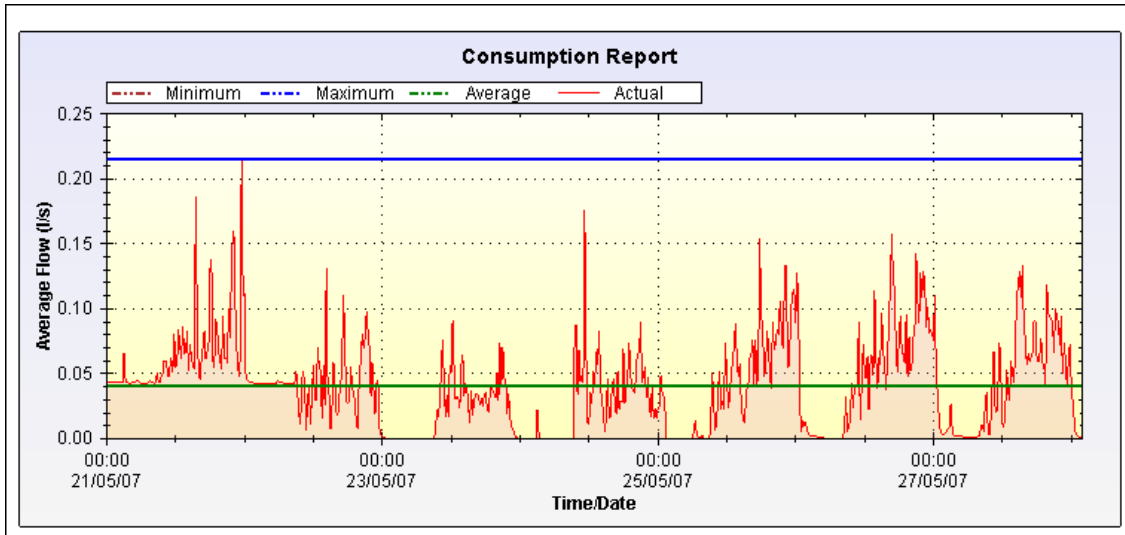
- a week in February
 - the week leading up to Christmas
 - the Christmas week
 - a week after the final water efficiency measures were implemented.
- Savings from installing urinal controls were based on a flushing rate of 7.5 litres per hour per urinal space (the maximum flushing volume allowed under the Water Supply (Water Fittings) Regulations 1999.)
 - Following detailed data analysis of premises where controls were fitted, it was noted that although the flushing patterns changed to show zero flow when the premises were closed, overall savings were not as great as calculated. Although the urinals are no longer flushing at night, the increased use during the day, in effect, negates the overnight savings. On the flip side, hygiene standards have definitely improved.
 - In April 2008 ech₂o revisited the premises where excess water use for urinal flushing was occurring. We reduced the rate at which the urinals flush when the premises are opened. We expect that this measure will result in achieving the water savings originally calculated.
 - Calculated savings from further low-cost and zero-cost water efficiency measures implemented in 2008 total 1140m³ of water a year.
 - Analysing data from March 2007 to March 2008 across all premises shows that, apart from Pub C1U¹⁰, water use has fallen, proving that the water efficiency measures have been successful.

4.3 Pub C1U

- Pub C1U is a busy town centre pub, open from 11am–12 pm, seven days a week. It serves food.
- Estimated customer numbers are 1400 a week.
- Started reliable monitoring 17th March 2007. Data downloaded to 31st March 2008.



- The elevated readings at the beginning of the graph show uncontrolled flow which we traced to an underground leak in the meter chamber. The leak was repaired by Southern Water.



21st May to 27th May 2007

- When the loggers were first installed a minimum flow rate of 0.037 litres/second was recorded (equivalent to 33 litres over a 15 minute period). The leak was repaired and the flow rate dropped at night to 2 litres over a 15 minute period (the uncontrolled urinals filling up). The “repaired” leak failed and flow rate increased to 0.042 litres/second (45 litres over a 15 minute period). The leak was repaired for a second time after the urinal controls had been fitted. The graph clearly shows the flow rate reduction once the leak was repaired and a zero flow rate at night.

Pub C1U		
	Daily Consumption m ³	Flow rate litres/second
Minimum	0.60	0.000
Maximum	6.74	0.351
Average	2.86	0.029
Total consumption for 1 year: 1,112 m³		
Note: Maximum daily consumption figures occurred during second leakage period. Average and total figures are higher because of the leak.		

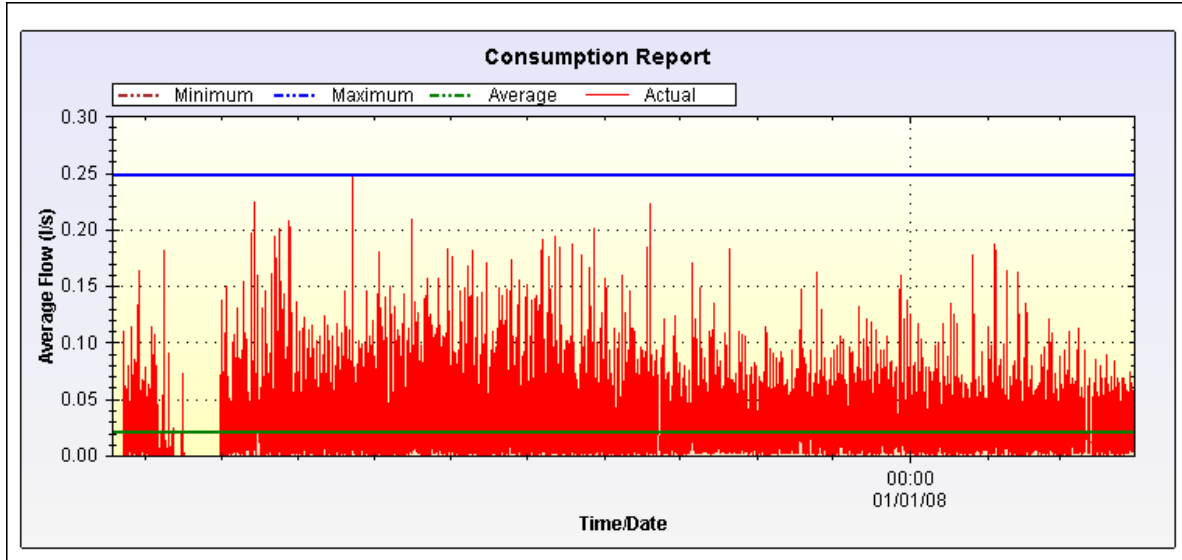
- The proprietor has full control over authorising whether low-cost and zero-cost measures can be implemented on site.
- No refurbishment of the WC areas has occurred within the last 10 years.
- Further water efficiency measures carried out in 2008 were:
 - adjusted flow rates in two public WCs, 1 x male, 1 x female
 - provided “Be Water Aware” signage for publican to display
 - adjusted urinal control time settings.

- Detailed analysis of the data downloads shows that there was a slight overall increase in average weekly water consumption by March 2008. We identified this as being due to a higher frequency of urinal flushing when the premises are open, after controls had been fitted.
- In April 2008 ech₂o reduced the rate at which the urinals flush when the premises are opened and expect that this measure will result in achieving the water savings originally calculated.
- Calculated savings due to 2008 measures are 49m³ of water per year.
- Total estimated savings from water efficiency measures installed or instigated by ech₂o under the SEEDA funded projects are 257m³ per year. There was a further estimated 182m³ saved as a one-off from rectifying the leak.
- Following adjustment of the urinal control time settings we expect to achieve a fall in overall in average weekly water consumption from January 2007 to March 2008 proving that the water efficiency measures have been successful.

Pub C1U		
Water efficiency measures implemented		
Details	Date	Expected water savings m³/year
Identified leak and alerted publican ¹	Feb 2007	182
Adjusted Flow rate at taps in women's WC	Feb 2007	51
Fitted urinal controls to 4 spaces	May 2007	157
Reduced WC flush volumes (save-a- flush) to 2 public WCs	Feb 2008	49
Supplied "Be Water Aware" signage for publican to display ²	Mar 2008	Not Calculated
Adjusted urinal control time settings ³	April 2008	Not Calculated
Total savings per year		257
Further expected savings due to 2008 measures		49
Notes: 1. This was a one off saving and is not therefore not added to year on year savings 2. It is not possible to accurately calculate the effect signage will have on behaviour 3. No data after urinal controls adjusted.		

4.4 Pub C2U

- Pub C2U is a busy pub located in one of the satellite shopping centres in Crawley. It is open from 11 am – 12 pm, seven days a week, with a late night licence on some Fridays and Saturdays. It serves food.
- Estimated customer numbers are 1000 a week.
- Started reliable monitoring 22nd March 2007. Data downloaded to 31st March 2008.



- Analysis of the data in April 2007 highlighted a base flow minimum of 1 litre every 15 minutes, which indicated that the urinal controls fitted in these premises were not working. New controls were installed under the project.

Pub C2U		
	Daily Consumption m ³	Flow rate litres/second
Minimum	0.90	0.000
Maximum	3.47	0.248
Average	2.08	0.021
Total consumption for 1 year: 821 m³		

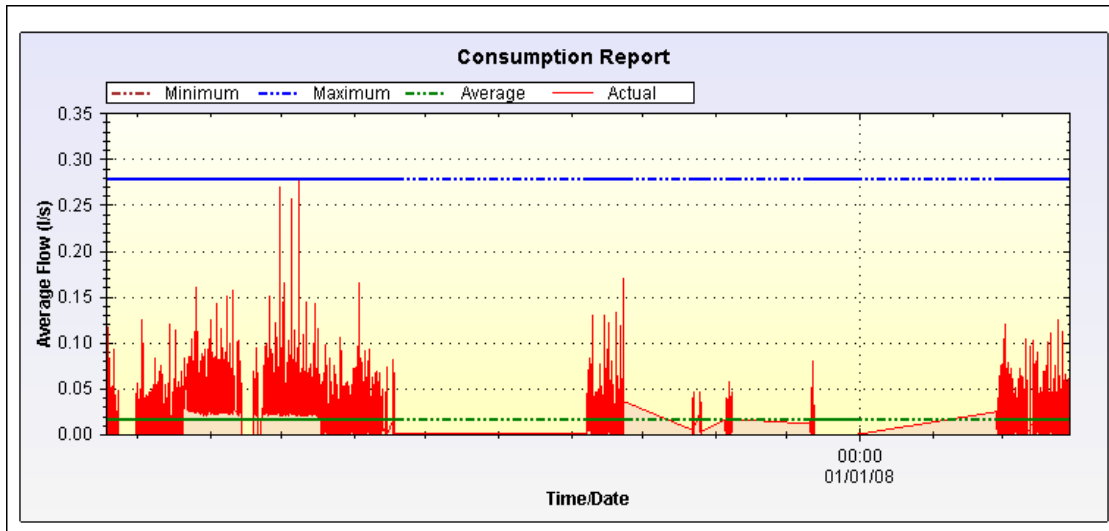
- The proprietor has full control over authorising whether low-cost and zero-cost measures can be implemented on site.
- No refurbishment of the WC areas has occurred within the last 10 years. There are plans to update these facilities within the short-term.
- Detailed analysis of the data downloads shows that there was a slight overall increase in average weekly water consumption by March 2008. We identified this as being due to a higher frequency of urinal flushing when the premises are open, after controls had been fitted than before.
- In April 2008 ech₂o reduced the rate at which the urinals flush when the premises are opened and expect that this measure will result in achieving the water savings originally calculated.
- Further water efficiency measures carried out in 2008 were:
 - provided “Be Water Aware” signage for publican to display
 - adjusted urinal control time settings.
- It is not possible to accurately calculate savings from water efficiency measures implemented in 2008.
- Total estimated savings from water efficiency measures installed or instigated by ech₂o under the SEEDA funded projects are 192m³ per year.

- Detailed analysis of the data downloads shows that there was an overall reduction in average weekly water consumption between January 2007 and March 2008 proving that the water efficiency measures have been successful.

Pub C2U		
Water efficiency measures implemented		
Details	Date	Expected water savings m³/year
Reduced WC flush volumes (save-a- flush) 1 x staff WCs	Feb 2007	6
Reduced WC flush volumes (save-a- flush) 5 x public WCs	Feb 2007	55
Fitted urinal controls to 4 spaces	May 2007	131
Supplied "Be Water Aware" signage for publican to display ¹	March 2008	Not Calculated
Adjusted urinal control setting ²	April 2008	Not Calculated
Total savings per year		192
Notes: 1. It is not possible to accurately calculate the effect signage will have on behaviour		
2. No data after urinal controls adjusted		

4.5 Pub C3U

- Pub C3U is a quiet local pub located in one of the satellite shopping centres in Crawley. It is open at lunchtimes and in the evenings.
- Estimated customer numbers are 350 a week.
- Started reliable monitoring 2nd March 2007. Data downloaded to 31st March 2008.



- There was a large amount of incomplete data and it was unclear exactly how reliable the data was. At times the data downloads appear to indicate a large leak; at other times they showed no unexplained usage. However, overall consumption is high for a pub of this size and it is possible that there is a leak on the underground pipe between the meter and the premises. The meter is sited outside the nearby public toilets about 20 metres from the pub. The inconsistency of the data downloads meant that we could not reliably inform the publican that there was an external leak and the high costs of exploratory searches meant that this possibility was not explored.

Pub C3U		
	Daily Consumption m ³	Flow rate litres/second
Minimum	0.47	0.000
Maximum	4.98	0.278
Average	3.07	0.062
Total consumption for 1 year: 316.5 m³		
Note: Total consumption figure is for data logger period only and does not represent a year's consumption		

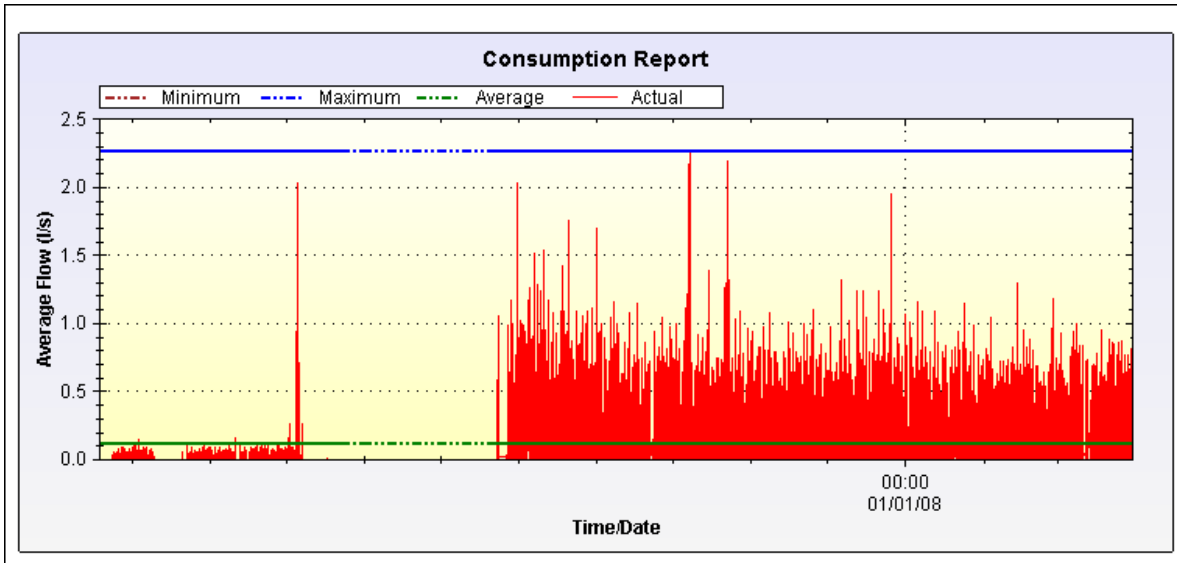
- The proprietor has full control over authorising whether low-cost and zero-cost measures can be implemented on site.
- No refurbishment of the WC areas has occurred within the last 10 years. There are no plans to update these facilities within the short-term.
- Detailed analysis of the data downloads shows that there was a slight overall increase in average weekly water consumption by March 2008. We identified this as being due to a higher frequency of urinal flushing when the premises are open, after controls had been fitted.
- In April 2008 ech₂o reduced the rate at which the urinals flush when the premises are opened and expect that this measure will result in achieving the water savings originally calculated.
- Further water efficiency measures carried out in 2008 were:
 - adjusted timer on urinal control to reduce overall flushing volumes.
- It is not possible to accurately calculate savings from water efficiency measures implemented in 2008.
- Total estimated savings from water efficiency measures installed or instigated by ech₂o under the SEEDA funded projects are 109 m³.
- Detailed analysis of the data downloads shows that there was an overall reduction in average weekly water consumption between January 2007 and March 2008 proving that the water efficiency measures have been successful.

Pub C3U		
Water efficiency measures implemented		
Details	Date	Expected water savings m ³ /year
Reduced WC flush volumes (save-a- flush) 3 x public WCs	Feb 2007	11
Fitted urinal controls	May 2007	98
Supplied "Be Water Aware" signage for publican to display	March 2008	Not calculated
Adjusted urinal controls	April 2008	Not calculated
Total savings per year		109
Total savings due to 2008 measures		Not calculated
Note: Flow rates cannot be adjusted		



4.6 Pub C4

- Pub C4 is a small pub in a leafy suburb of Crawley. It is open from 11 am-2 pm and 6pm-11pm, seven days a week. It serves food
- The current owners took over the premises in September 2006 and were shocked by the size of their water bill. They subsequently carried out a series of water saving measures following advice from Crawley Council. This is now a very water-aware pub with both publicans and staff aware of the importance of being water efficient.
- Estimated customer numbers are 560 a week..
- Started reliable monitoring 21st February 2007. Data downloaded to 31st March 2008



- Loggers failed in May 2007. Came back on-line July 2007 but with the readings out by a factor of 10.

Pub C4		
	Daily Consumption m ³	Flow rate litres/second
Minimum	0.35	0.000
Maximum	2.58	0.227
Average	1.46	0.012
Total consumption over logged period: 390.3 m³		
Note: daily consumption and flow rates adjusted to allow for logging error		

- The publican has complete control over authorising whether low-cost and zero-cost measures can be implemented on site.
- Further water efficiency measures carried out in 2008 were:
 - Supplied “Be Water Aware” signage for publican to display.
- It is not possible to accurately calculate savings from water efficiency measures implemented in 2008.
- Total estimated savings from water efficiency measures installed or instigated by ech₂o under the SEEDA funded projects cannot be accurately calculated but we expect water savings to occur from behaviour change due to the signage.

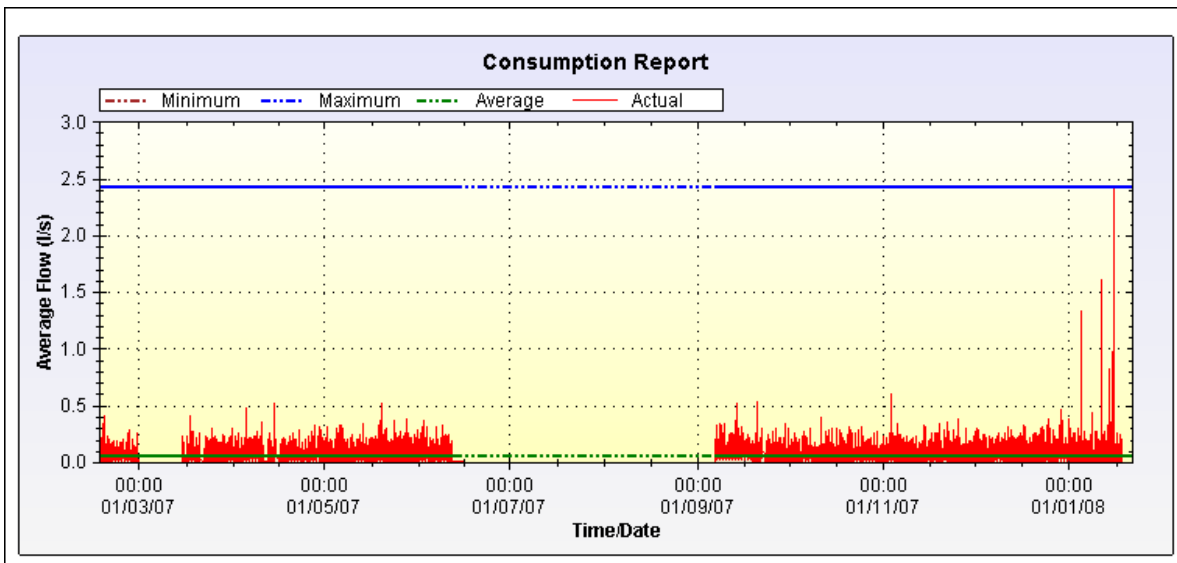


- Notwithstanding the inconsistent data from the data loggers, detailed analysis of the data downloads shows that there was a slight overall reduction in average weekly water consumption between January 2007 and March 2008. This was from upgrading one of the WCs to a 6 litre single flush, and a heightened level of water awareness by the publican and staff.

Pub C4		
Water efficiency measures implemented		
Details	Date	Expected water savings m ³ /year
None in first project ¹		
Supplied "Be Water Aware" signage for publican to display	Mar 2008	Not calculated
Total savings per year ²		0
Total savings due to 2008 measures		Not calculated
Note: 1 and 2. All water efficiency measures had been implemented by the publican before ech ₂ o visited the premises. Therefore no savings are made by ech ₂ o under the project.		

4.7 Pub C5U

- This is a popular pub that serves food. It is located in one of the satellite shopping areas. The pub has a garden and a nearby park and is popular at lunchtimes as well as evenings.
- Estimated customer numbers are 1500 a week.
- Started reliable monitoring 19th March 2007. Data downloaded to 16th January 2008



- There was a large break in data from mid-June 2007 until early September 2007 and then the data logger ceased to function completely on 16th January 2008.
- Base flow rate after the urinal controls were fitted was 0.008 litres/second as opposed to zero. We traced this usage to an ice machine in the cellar.

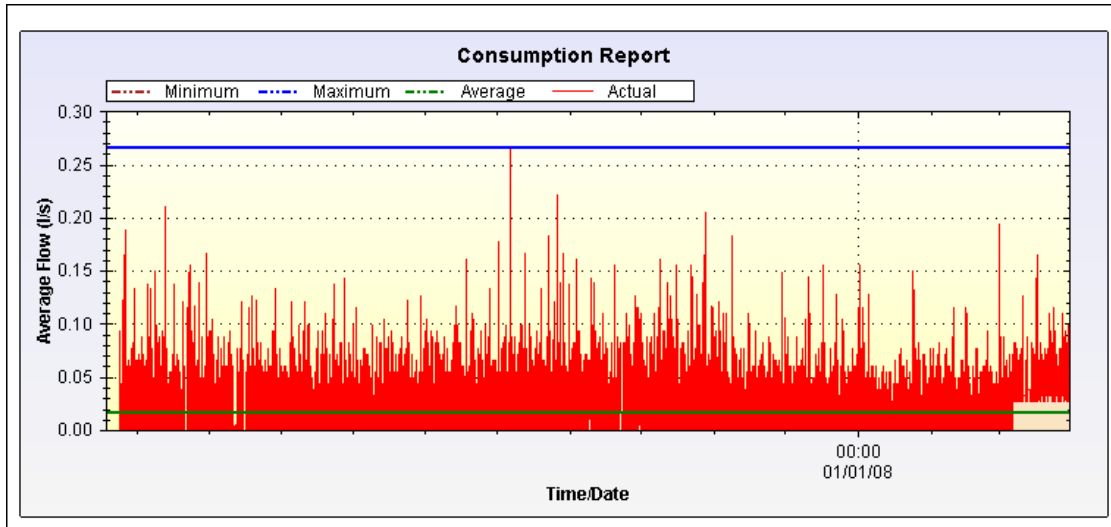
Pub C5U		
	Daily Consumption m³	Flow rate litres/second
Minimum	3.6	0.000
Maximum	9.7	2.435
Average	5.6	0.062
Total consumption over the data logged period: 1495.0 m³		
Note: Maximum flow rate of 2.435 is 146 litres minute and is an error on the reading (see spike at right hand side of graph)		

- The publican has control over authorising whether low-cost and zero-cost measures can be implemented on site.
- All public WC areas were upgraded in Feb 2008. Existing WCs were upgraded to six litre flush WCs. Flow rates were reduced at all washbasins to 4 litres/minute.
- The malfunction of the data logger occurred before the refurbishment work was implemented. Therefore savings from these measures cannot be analysed. Based on customer numbers, we estimate that these upgrades save a further 288m³ of water a year from reduced flush volumes and reduced water use for hand washing.
- Further water efficiency measures carried out in 2008 were:
 - supplied "Be Water Aware" signage for publican to display.
- It is not possible to accurately calculate savings from water efficiency measures implemented in 2008.
- Total estimated savings from water efficiency measures installed or instigated by ech₂o under the SEEDA funded projects are 390m³.
- Detailed analysis of the data downloads shows that there was an overall reduction in average weekly water consumption between January 2007 and January 2008 proving that the water efficiency measures implemented by ech₂o have been successful. The refurbishment of the WCs carried out by the publican will lower the average weekly water consumption still further.

Pub C5U		
Water efficiency measures implemented		
Details	Date	Expected water savings m³/year
Adjusted flow rates at taps (kitchen area)	Feb 2007	44
Reduced WC flush volumes (save-a- flush) 8 x customer WCs and 1 x staff WCs	Feb 2007	111
Fitted urinal controls to 8 spaces	May 2007	268
Supplied "Be Water Aware" signage for publican to display	Mar 2008	Not calculated
Total savings per year		423
Total savings due to 2008 measures		Not calculated
Note:		

4.8 Pub C6

- Pub C6 is a local pub sited in one of the satellite shopping centres.
- Estimated customer numbers are 490 a week.
- Started reliable monitoring 19 March 2007. Data downloaded to 31 March 2008.



- The pub had the existing urinal controls installed in November 2006. They worked on usage control rather than time control and, due to low volume of use, odour from the urinals became problematic as they were not flushing often enough. After the smoking ban was implemented in July 2007 the problem became more acute. The publican was paying a high monthly charge for the controls and eventually requested that they be removed.
- The controls were removed in the middle of March 2008. We noticed the sudden unexplained usage when analysing the data on 29th March 2008. We calculated that removing the controls was resulting in an uncontrolled use of 2.42m³ of water per day. We immediately alerted the publican by phone and explained how to reduce the flow manually.¹¹ We followed this with a letter detailing the amount of water being wasted with an offer to fit controls under the project for free.¹²
- Controls were fitted to the urinals on 12th May 2008. We estimate this measure will save 547m³ of water a year from the uncontrolled flow.

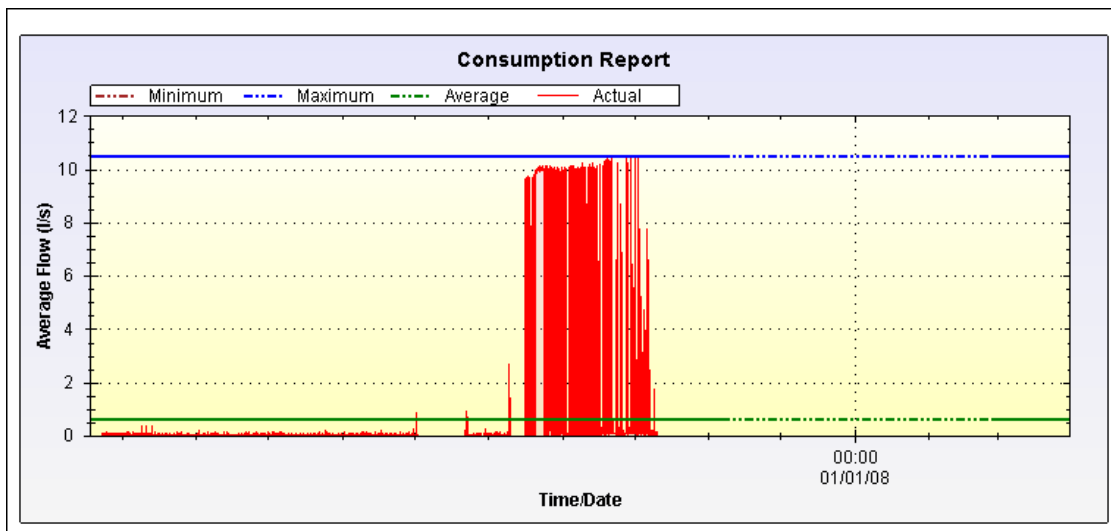
Pub C6U		
	Daily Consumption m ³	Flow rate litres/second
Minimum	0.9	0.000
Maximum	2.3	0.267
Average	1.5	0.062
Total consumption for 1 year: 1495.0 m³		
Note: Daily consumption figures taken before urinal controls removed. Yearly consumption figures include uncontrolled urinal flow		

- The proprietor has full control over authorising whether low-cost and zero-cost measures can be implemented on site.
- No refurbishment of the WC areas has occurred within the last 10 years.
- Further water efficiency measures carried out in 2008 were:
 - fitted 2 x urinal controls to the newly uncontrolled urinals.
- Calculated savings due to 2008 measures are 547m³ of water per year.
- Total estimated savings from water efficiency measures installed or instigated by ech₂o under the SEEDA funded projects are 585m³ of water per year.
- Detailed analysis of the data downloads shows that there was an overall reduction in average weekly water consumption between January 2007 and March 2008 (before the urinal controls were removed) proving that the water efficiency measures have been successful.

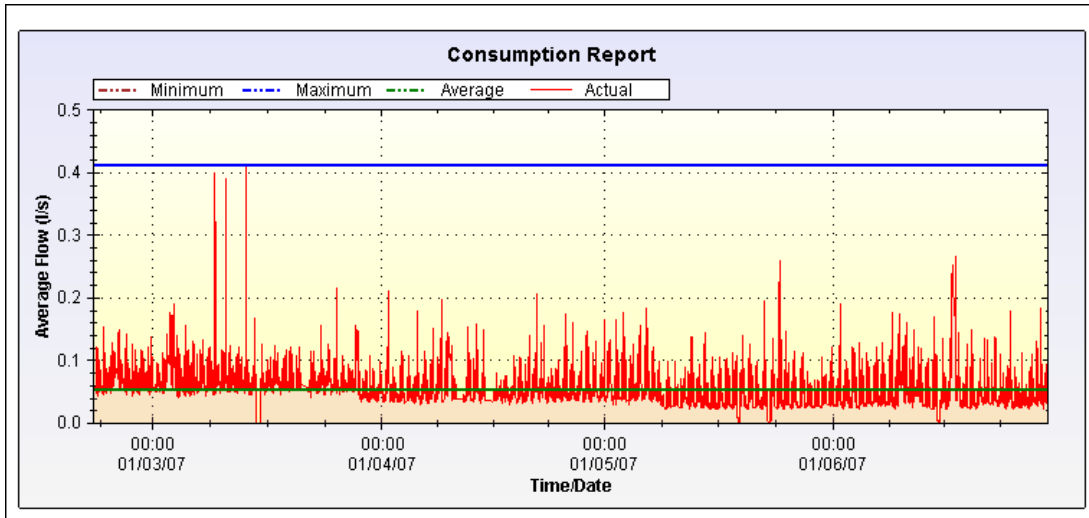
Pub C6U		
Water efficiency measures implemented		
Details	Date	Expected water savings m³/year
Reduced WC flush volumes (save-a- flush) 7 x public WCs	Feb 2007	36
“Be Water Aware” signage for publican to display	March 2008	Not calculated
Fitted urinal controls	May 2008	547
Total savings per year		585
Total savings due to 2008 measures		547
Note: Flow rates cannot be adjusted on taps		

4.9 Pub C7

- Pub C7 is a large pub/nightclub located in one of the satellite shopping centres in Crawley. It is open from 11 am- 12 pm all days, with a late night licence until 2 am on Fridays and Saturdays. It serves bar food.
- Estimated customer numbers are 1225 a week.
- No refurbishment of the WC areas has occurred within the last 10 years. There are no plans to update these facilities within the short-term.
- Started reliable monitoring 19th March 2007. Data downloaded to 31st March 2008.



- There is a large amount of incomplete data. We assume that data was reliable up to July 2007 when the loggers began recording exceedingly high levels of usage and then stopped working altogether.



- A closer look at the data before major logger malfunction clearly shows underlying uncontrolled usage. A base flow (per 15 minute period) of 27 - 45 litres indicates either a leak or uncontrolled (and rapid) refill of urinal cisterns. When ech₂o carried out the original audit they notified the manager that the urinal in the bar area was filling too rapidly and needed to be adjusted. The stepped reduction of underlying base flow, shown in the graph, indicates that the duty manager was adjusting something in an attempt to reduce the base level of uncontrolled usage.

Pub C7		
	Daily Consumption m ³	Flow rate litres/second
Minimum	3.05	0.000
Maximum	7.20	0.413
Average	4.80	0.054
Total consumption m³ : unavailable due to logger malfunction		
Note: Total consumption figures not available due to severe malfunction of data from the logger		

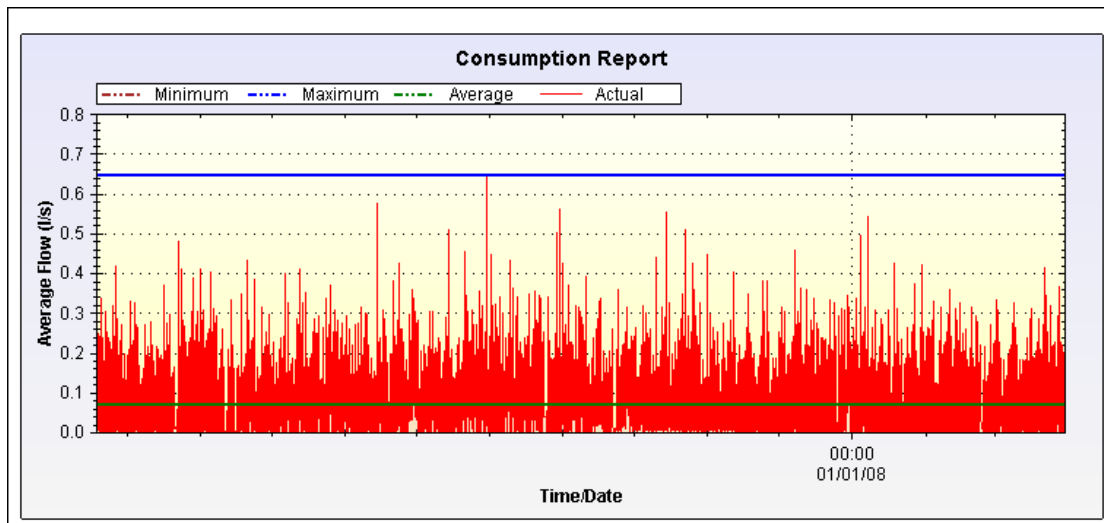
- The duty manager has little control over authorising whether low-cost and zero-cost measures can be implemented on site.
- The original duty manger was very keen on implementing low-cost and zero-cost water efficiency measures in the premises. By March 2008 he had left and the current duty manger was not very interested, showing how important buy-in by the person in charge on-site.

- There were no further water efficiency measures carried out in 2008 as the duty manager was not open to any suggested measures. Total savings due to 2008 measures are therefore zero.
- Total estimated savings from water efficiency measures installed or instigated by ech₂o under the SEEDA funded projects are 490 m³.

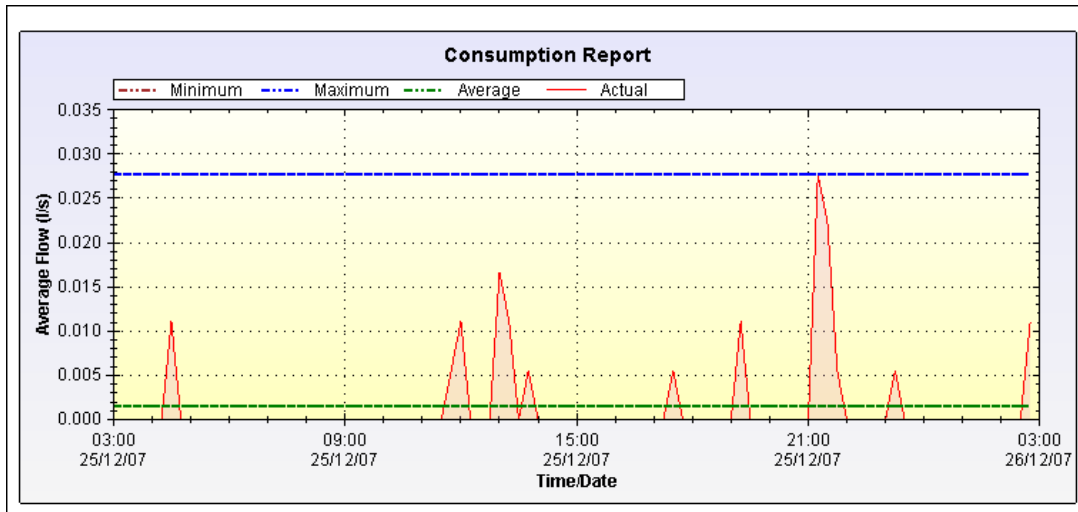
Pub C7		
Water efficiency measures implemented		
Details	Date	Expected water savings m ³ /year
Adjusted flow rates at taps (bar area)	Jan 2007	32
Reduced WC flush volumes (save-a-flush) 12 out of 16 x public WCs	Jan 2007	64
Notified publican that urinal cistern in bar area filling at 4 times the maximum allowed under the Water Regulations and should be adjusted	Jan 2007	394
Visited but no further measures ¹	March 2008	0
Total savings per year		490
Total savings due to 2008 measures		0
Note: 1. Current manager not interested in water efficiency measures		

4.10 Restaurant C1

- Restaurant C1 is located in a retail park near to the centre of Crawley. It is a busy chain restaurant. It is open from 11 am- 12 pm all days, with a late night licence on some Fridays and Saturdays. It does not shut in the afternoon but does experience a large downturn in customer numbers between the hours of three and six.
- Customer numbers as supplied by the duty manager average 2200 a week.
- Started reliable monitoring 10th February 2007. Data downloaded to 31st March 2008.



- Following the original audit, average consumption dropped by 1.2m³ per day in April 2007 compared to March 2007. We consider this to be due to heightened water awareness by the staff.



- As the premises are shut for the whole of Christmas Day (the only one of the premises logged for which this condition occurred) it allows analysis of water use while the premises are empty. From 3 a.m. on the 25th of December to 3 a.m. on the 26th of December, 150 litres of water was used for sanitary flushes at urinals and other unidentified usage, possibly the ice making machine

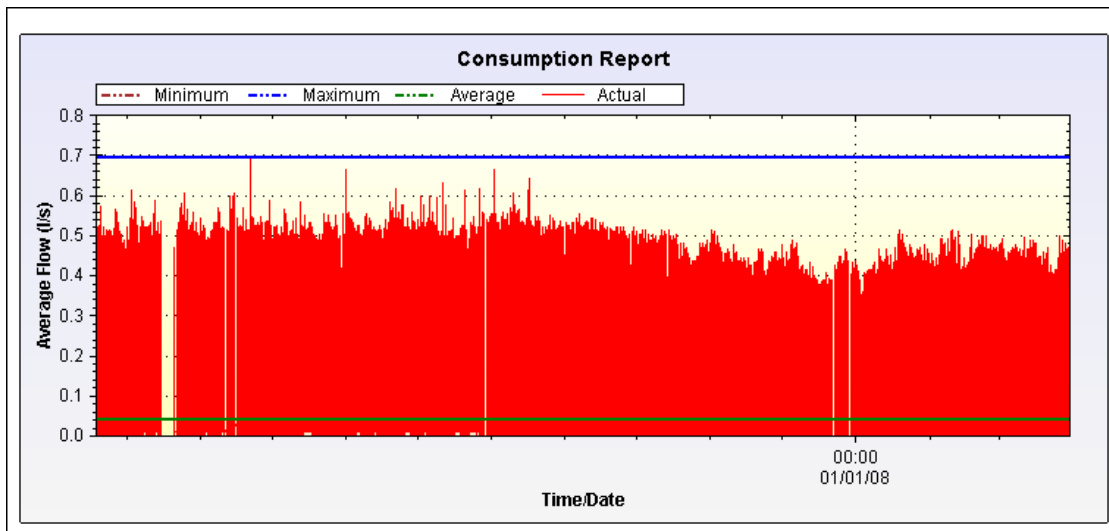
Restaurant C1		
	Daily Consumption m ³	Flow rate litres/second
Minimum	3.84	0.000
Maximum	9.75	0.650
Average	6.83	0.071
Total consumption for 1 year: 2769 m³		
Note:		

- The duty manager has some control over authorising whether low-cost and zero-cost measures can be implemented on site.
- The WC areas were refurbished in 2005 and urinal controls, 6 litre single flush WCs and automatic taps were all installed. In 2007 ech₂o fitted save-a-flush bags to staff WCs only.
- Further water efficiency measures carried out in 2008 were:
 - adjusted flow rates by 41% on average at kitchen.
- Calculated savings due to 2008 measures are 304m³ of water per year.¹³
- Total estimated savings from water efficiency measures installed or instigated by ech₂o under the SEEDA funded projects are 310m³ a year.
- Detailed analysis of the data downloads shows that there was an overall reduction in average weekly water consumption between January 2007 and March 2008 proving that the water efficiency measures have been successful.

Restaurant C1		
Water efficiency measures implemented		
Details	Date	Expected water savings m³/year
Reduce flow rates for 2 x staff WCs	Feb 2007	6
Reduced flow rates at kitchen taps by 41% ¹	March 2008	304
Supplied "Be Water Aware" signage for duty manager to display in kitchen area	March 2008	Not calculated
Total savings per year		310
Total savings due to 2008 measures		304
Note: 1. Flow rates at kitchen taps were reduced on average by 41%. The potential for savings is very high. Further empirical evidence is required to analyse how accurate the figure of 304m ³ /year proves to be.		

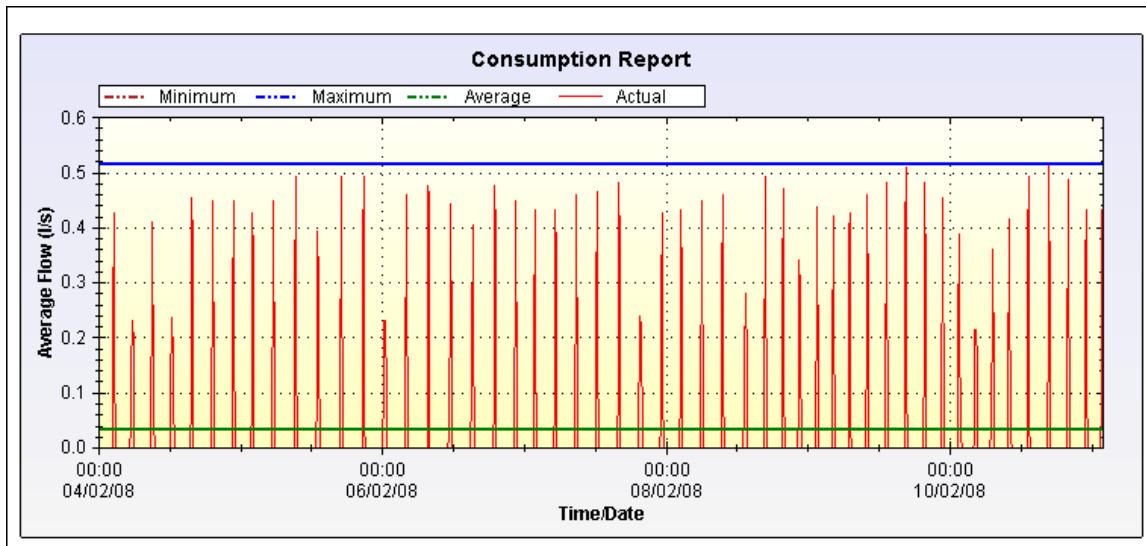
4.11 Club C1

- Club C1 is a large nightclub in the centre of Crawley. The club was open all nights of the week.
- Estimated customer numbers are unknown.
- The duty manager had partial control over authorising whether low-cost and zero-cost measures could be implemented on site. Head office gave approval for the data loggers to be fitted on his recommendation.
- Started reliable monitoring 22 March 2007. Data downloaded to 31 March 2008



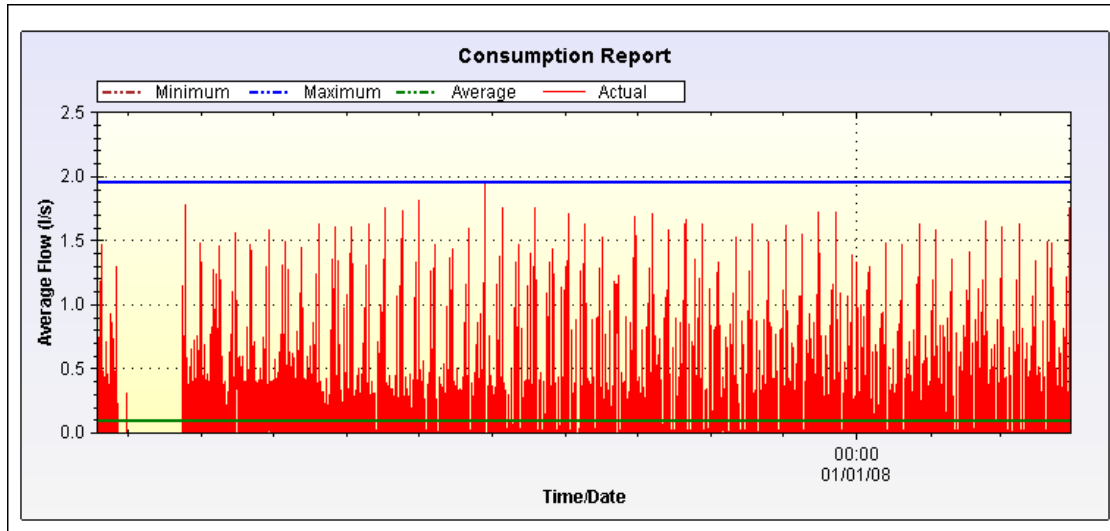
Club C1		
	Daily Consumption m ³	Flow rate litres/second
Minimum	2.95	0.000
Maximum	10.27	0.694
Average	5.76	0.043
Total consumption for 1 year: 1,678m³		
Note: Premises were shut down August 2007		

- The club shut down in August 2007, but the overall pattern of water use, and total daily consumption changed little from when the premises was open. Detailed analysis of the data downloads in March 2008 showed that even after the premises had closed there was a regular daily use of 3000 litres. Further analysis showed that this was not leakage but spikes of water usage approximately every 4 hours.
- In a typical week before shut down, usage was 33m³ of water a week. In a typical week after shut down it was still 23m³ a week.
- It is not entirely clear what these spikes are but the most likely explanation is a timed urinal flush, possibly a sanitary flush. ech₂o notified the head office by telephone, email and letter to this wastage of water, suggesting it would be easy to shut down the water supply to the premises until it reopened and detailing the cost saving to the company. However, no reply was received and we therefore assume the wastage of water is still occurring.



4.12 Club C2

- Club C2 is a large nightclub in the centre of Crawley. The club is open on Tuesday, Friday Saturday and Sunday nights. Because the club is open until 3 am, water use spills over into the next day, and a large proportion of (for example) Sunday consumption is in fact Saturday night consumption.
- Estimated customer numbers are 4610 a week.
- Started reliable monitoring 22nd March 2007. Data downloaded to 31st March 2008.



- Daily consumption shows a sharp increase in water use at weekends when the club is open.

Club C2		
	Daily Consumption m ³	Flow rate litres/second
Minimum	4.08	0.000
Maximum	22.79	1.956
Average	11.56	0.100
Total consumption for 1 year: 3870 m³		
Note:		

- The duty manager has partial control over authorising whether low-cost and zero-cost measures can be implemented on site.
- Further water efficiency measures carried out in 2008 were:
 - adjusted flow rates in all public WCs, male and female.
- Calculated savings due to 2008 measures are 240m³ of water per year.
- Total estimated savings from water efficiency measures installed or instigated by ech₂o under the SEEDA funded projects are 1358m³ of water per year.
- Detailed analysis of the data downloads shows that there was an overall reduction in average weekly water consumption between January 2007 and March 2008 proving that the water efficiency measures have been successful.¹⁴

Club C2U		
Water efficiency measures implemented		
Details	Date	Expected water savings m³/year
Reduced WC flush volumes (save-a- flush) in 43 out of 53 public WCs	Feb 2007	194
Fitted urinal controls to 16 spaces	May 2007	924
Reduced flow rates at taps in public WCs	Feb 2008	240
Supplied "Be Water Aware" signage for publication to display	Mar 2008	Not calculated
Total savings per year		1358
Total savings due to 2008 measures		240

5. Best practice premises

- Five premises were chosen to demonstrate best practice with regard to implementing low-cost and zero-cost water efficiency measures.
- Premises were not rated purely on amount of water saved, but on a variety of criteria.
- All premises demonstrated a willingness by on-site personnel (whether owners, duty managers or staff) to engage with the importance of sustainable water use within the hospitality sector.
- All premises appreciated the role that education plays in making a pub, restaurant or nightclub water efficient.
- One of the premises was already very water aware before they were audited by ech₂o. One was partially aware and one was very sceptical about anything to do with water efficiency.
- Savings from water use are calculated using estimated customer numbers as supplied by the premises, and estimated average use of different appliances. Savings from urinal flushing are calculated on shut-down times of the premises and a flushing rate of 7.5 litres per urinal space per hour.
- Savings from CO₂ emissions are calculated using the average UK figure of 0.6 kgCO₂ per m³ of water
- Monetary savings are calculated using the 2008/09 cost of water. In the Crawley area, Southern Water supply the water and Thames Water remove the foul water. Water costs are low at just £1.30 per m³. For comparison in the South East, generally average costs are £2.21 and the highest charge is £3.12 paid by “Zone 2” South East Water customers. Average cost per m³ of water the whole of UK is £2.50, the highest charge £4.27 for South West Water customers. Therefore similar measures to those implemented in the best practice premises, would result, in other parts of the UK, in substantially higher monetary savings.
- Premises are presented in alphabetical order.

5.1 Bar Med

- Bar Med is a popular nightclub situated in the centre of Crawley. It is open five nights a week from 7.30 pm to 2 am.
- Bar Med already had urinal controls fitted before the audit by ech₂o, and had signs behind the bar about saving water. It was the only premises in Crawley where head office sent reminders about saving water as well as saving energy. The duty manager had seen the signs indicating the save-a-flush bags fitted in Liquid and Envy and was keen for us to install them in Bar Med as well.
- Bar Med saves 757m³ of water a year, which is 454 kgsCO₂ not emitted and a saving of £984 at current prices.

Bar Med				
		Savings Water m ³ /yr	Savings CO ₂ emissions KgCO ₂ /yr	Savings £/yr
Type of establishment	Night Club			
Estimated average number of customers per week	4200			
No. of WCs	15			
No. of WCs with save-a- flush bags fitted by the Saving Water in Crawley project	15	323.8	194.3	420.94
No. of urinal spaces	6			
No. of urinal spaces controlled by premises	6	320.6	192.4	416.78
Percentage reduction in flow rates from bar taps under the Saving Water in Crawley project	25%	112.8	67.7	146.64
Total savings made per year		757.2	454.4	984.36

5.2 Brewery Shades

- Brewery Shades is a busy town centre pub, open from 11 am- 12 pm, seven days a week. It serves food.
- When ech₂o first visited the premises there were no water efficiency measures implemented. Since then a wide range of measures have been installed, and the proprietor has always been willing to experiment with any measure that we have suggested.
- Brewery Shades saves 257m³ of water a year, which is 154 kgsCO₂ not emitted and a saving of £334 at current prices.

Brewery Shades				
		Savings Water m ³ /yr	Savings CO ₂ emissions KgCO ₂ /yr	Savings £/yr
Type of establishment	Pub with sit down meals			
Estimated average number of customers per week	1400			
No. of WCs	3			
No. of WCs with save-a- flush bags fitted by the Saving Water in Crawley project	2	48.7	29.2	63.31
No. of urinal spaces	4			
No. of urinals spaces controlled under the Saving Water in Crawley project	4	157.0	94.2	204.10
Percentage reduction in flow rates from WC taps under the Saving Water in Crawley project	35.2%	51.3	30.8	66.69
Total savings made per year		257.0	154.2	334.10

5.3 Liquid and Envy

- Liquid and Envy is a large nightclub in the centre of Crawley. The club is open on Tuesday, Thursday, Friday and Saturday nights from 9 pm until 2 am.
- When ech₂o first contacted the premises they were very keen for a water audit and any low-cost and zero-cost water efficiency measures that were available as, following a refurbishment of the WC areas, all the existing urinal controls had been removed. The technical manager was aware that a lot of water was therefore being wasted when the premises were shut.
- Liquid and Envy saves 1337m³ of water a year, which is 802 kgsCO₂ not emitted and a saving of £1738 at current prices.

Liquid and Envy				
		Savings Water m ³ /yr	Savings CO ₂ emissions KgCO ₂ /yr	Savings £/yr
Type of establishment	Night Club			
Estimated average number of customers per week	4610			
No. of WCs	53			
No. of WCs with save-a- flush bags fitted by the Saving Water in Crawley project	43	194.2	116.5	252.46
No. of urinal spaces	16			
No. of urinals spaces controlled under the Saving Water in Crawley project	16	923.5	554.1	1200.55
Percentage reduction in flow rates from WC taps under the Saving Water in Crawley project	22.2%	219.2	131.5	284.96
Total savings made per year		1336.9	802.1	1737.97

5.4 Plough Inn

- Plough Inn is a small pub in a leafy suburb of Crawley. It is open from 11 am-2 pm and 6 pm-11pm, seven days a week. It serves food.
- The current owners took over the premises in September 2006 and were shocked by the size of their water bill. They subsequently carried out a series of water saving measures following advice from Crawley Council. This is now a very water aware pub with both publicans and staff aware of the importance of being water efficient.
- Plough Inn saves 152m³ of water a year, which is 91 kgsCO₂ not emitted and a saving of £198 at current prices.

Plough Inn				
		Savings Water m ³ /yr	Savings CO ₂ emissions KgCO ₂ /yr	Savings £/yr
Type of establishment	Pub with sit down meals			
Estimated average number of customers per week	560			
No. of WCs	3			
No. of WCs with save-a- flush bags fitted by the premises	2	19.5	11.7	23.35
No. of 6 litres flush WCs fitted by premises	1	14.6	8.8	18.98
No. of urinal spaces	3			
No. of urinal spaces controlled by premises	3	117.9	70.7	153.27
Total savings made per year		152.0	91.2	195.6

5.5 Tavern on the Green

- Tavern on the Green is located in one of the satellite shopping areas of Crawley. It is open seven days a week, twelve hours a day and serves food. The pub has a garden and a nearby park and is popular at lunchtimes as well as evenings.
- The publican was originally sceptical about the usefulness of a water audit and was not keen for ech₂o to visit. However, he did want to lower his water bills. Once on site we calculated the savings for him that simple measures could make, at which point he was very willing for us to install save-a-flush bags, reduce flow rates where possible, and arrange for urinal controls to be fitted. He also realised that refurbishing the WC blocks completely would make financial sense as well as bring more pleasant for the customers and did this in January 2008.
- Tavern on the Green saves 711m³ of water a year, which is 427 kgsCO₂ not emitted and a saving of £924 at current prices.

The Tavern on the Green				
		Savings Water m ³ /yr	Savings CO ₂ emissions KgCO ₂ /yr	Savings £/yr
Type of establishment	Pub with sit down meals			
Estimated average number of customers per week	1500			
No. of WCs	8			
No. of WCs with save-a- flush bags fitted by the Saving Water in Crawley project	8	110.6	66.36	143.78
No. of 6 litre flush WCs fitted by premises	8	156.0	93.6	202.80
No. of urinal spaces	8			
No. of urinals spaces controlled under the Saving Water in Crawley project	8	268.0	160.8	348.40
Percentage reduction in flow rates from kitchen and bar taps under the Saving Water in Crawley project	23%	44.3	26.58	57.59
Percentage reduction in flow rates from WC taps after WC refurbishment carried out by premises	44%	132.2	79.32	171.86
Total savings made per year		711.1	426.7	924.43



6 Working with Local Authority partners

- Headline findings from the Saving Water in Crawley's Hospitality Sector project were that overall condition of WCs, urinals and taps across the hospitality sector were poor, with very few refurbishments having been carried out since 2001.¹⁵ Most WCs were flushing with 7.5 litres or 9 litres of water and half of the premises surveyed did not have working urinal controls. Flow rate at most taps were higher than required; only some flow rates could be adjusted using the isolating valves fitted.
- The level of water awareness within the hospitality sector was generally low. Most owners or managers had little idea of their water costs per year. They appreciated that saving water would reduce their bills and be good for the environment. However there was little knowledge of how easy or hard that would be to do, or which measures would save most water and prove most cost effective.
- There is an effective informal network for information gathering and dissemination amongst local business sectors. This informal network can make or break the success of a project.
- Due to a combination of installing save-a-flush bags, fitting urinal controls, adjusting excessive flow rates from taps and identifying major leaks, 5,065m³ of water was saved across 43 premises.
- It seems safe to assume that the situation is similar across this sector in most areas of the UK. By working with Local Authorities in the South East, it could be ascertained whether these findings, and the water savings made, were replicated.
- To enable savings to be made across a wider area, it was agreed that ech₂o would train personnel within partner Local Authorities to carry out the audits and implement the low-cost and zero-cost water efficiency measures themselves.

6.1 Project Terms

- Local Authorities are tasked to both adapt to and mitigate climate change. For Local Authorities in the south east, reducing the amount of water used in their areas will have a positive effect on both, as well as meeting their remit to conserve water.
- The project terms as set by ech₂o were that Local Authorities needed to actually implement low-cost and zero-cost water efficiency measures during the site audits.
- The project terms as set by SEEDA were that Local Authorities needed to audit a certain number of premises before the end of the project date to realise actual water savings. The figure was eventually set at 20.
- Initial Local Authority interest in the project was high. There were three main barriers to take up. These were:
 - the fact that they needed to make the savings in the 2007/08 financial year which was due to finish 3 months after the project was launched
 - identifying personnel to undertake the audits
 - a concern about the implications of carrying out the measures themselves on site.

- Eight Local Authority partners joined the project. They were: Aylesbury Vale District Council, Brighton and Hove City Council, Crawley Borough Council, Lewes District Council, Maidstone Borough Council, Medway Council, Reigate and Banstead Borough Council, and West Sussex County Council.

6.2 The Training and supporting tools



- Each Local Authority sent delegates to a full day's training where the lessons learned from the original survey were disseminated. Delegates got hands-on practical experience to carry out an actual water audit and implement low-cost and zero-cost water efficiency measures such as fitting save-a-flush bags and adjusting flow rates.
- We recommended that the delegates who attended the training should include the personnel who were going to carry out the actual audits. However, this did not always happen.
- The training on water efficiency, and the tools supplied, were designed to enable the Local Authority delegates to carry out water efficiency measures across other sectors under their jurisdiction using the knowledge gained on the course.

Save Water Save Money

This toilet has a Save-a flush bag fitted saving 1 litre of water with every flush

To get one free, contact your local water supplier

ech₂o consultants

- Partner Local Authorities were given free flow-measuring devices, save-a-flush bags and stickers. They could also get their logo printed onto posters to advertise the project in their local area, as well as proforma letters for various parts of the project including the individualised feedback.
- Sutton and East Surrey Water and Southern Water joined the scheme to support the Local Authority partners. This is a perfect match and should be encouraged in the future.
- Water audit template forms were supplied, as was a spreadsheet that summarised the water savings made during the audit.
- Dart Valley Systems agreed to allow individual premises to buy

The South East is Under Water Stress

Use Water Springly

SEEDA Brighton & Hove City Council ech₂o consultants

'Saving water in the hospitality sector' www.ech2o.com

urinal controls through the project at a discounted price.

- Feedback from Local Authority partners was that the training provided the right amount of confidence in order to implement appropriate low-cost and zero-cost water efficiency measures. As actual audits were carried out, confidence increased.

6.3 The spreadsheet

- To best analyse water savings across different areas and in areas with different pricing structures for water, it was imperative to design a spreadsheet so that all participating Local Authorities, would be using the same method to calculate water, carbon and CO₂ savings.
- The spreadsheet needed to be robust, easy to fill in and to give summary savings that would be useful to both the premises visited (who would receive a copy after the audit) and for the Local Authority and/or ech₂o to analyse. The results from all completed spreadsheets were collected and analysed by ech₂o and cumulative savings recorded

Saving Water in the Hospitality Sector in the South East											
Savings summary sheet			Establishment name: A. N. Other Public House								
			DAILY	WEEKLY	YEARLY	YEARLY	YEARLY	5 YEARLY	5 YEARLY	5 YEARLY	
PRE AUDIT WATER	ADJUSTMENTS	POST AUDIT WATER	SAVINGS WATER	SAVINGS WATER	SAVINGS WATER	SAVINGS CO2	SAVINGS MONEY £	SAVINGS WATER	SAVINGS CO2	SAVINGS MONEY £	
Litres used per day, estimated	% savings made by adjustments to flow rate or flush capacity	Litres used per day	water: litres per day	water: litres per week	m3 per year	kg per year	£ per year	m3 over 5 years	kg over 5 years	£ over 5 years at 4.0% inflation	
total	511	not applicable	455	56	392	20.4	12.26	£46.39	102.2	61.3	£251.27
public toilets	225	13.3%	195	30	210	11.0	6.57	£24.86	54.8	32.9	£134.63
staff toilets	0	0.0%	0	0	0	0.0	0.00	£0.00	0.0	0.0	£0.00
public wc taps	60	43.3%	34	26	182	9.5	5.69	£21.53	47.4	28.5	£116.64
staff wc taps	16	0.0%	16	0	0	0.0	0.00	£0.00	0.0	0.0	£0.00
restaurant taps	150	0.0%	150	0	0	0.0	0.00	£0.00	0.0	0.0	£0.00
bar area taps	60	0.0%	60	0	0	0.0	0.00	£0.00	0.0	0.0	£0.00
room taps	0	0.0%	0	0	0	0.0	0.00	£0.00	0.0	0.0	£0.00
showers	0	0.0%	0	0	0	0.0	0.00	£0.00	0.0	0.0	£0.00
ALL SAVINGS FOR URINALS DEPENDANT ON CONTROLS BEING FITTED											
PRE AUDIT			DAILY SAVINGS WATER	WEEKLY SAVINGS WATER	YEARLY SAVINGS WATER	YEARLY SAVINGS CO2	YEARLY SAVINGS MONEY £	5 YEARLY SAVINGS WATER	5 YEARLY SAVINGS CO2	5 YEARLY SAVINGS MONEY £	
Litres used per day		Litres used per day if controlled	water: litres per day	water: litres per week	m3 per year	kg per year	per year	m3 over 5 years	kg over 5 years	£ over 5 years at 4.0% inflation	
controlled urinals	540	540	0	0	0.0	0.00	£0.00	0.0	0.0	£0.00	
uncontrolled urinals	0	0	0	0	0.0	0.00	£0.00	0.0	0.0	£0.00	

- Actual figures of per capita water use within the hospitality sector have never been accurately calculated in the UK, apart from some information about water use in four and five star hotels. Water use is difficult to calculate per person, especially in pubs where length of customer stay



can vary from 15 minutes to several hours. After discussions with various individuals within the water industry the assumptions made are detailed in Table 6.1.

Figures used in spreadsheet to calculate savings from water efficiency measures			
Type of appliance	Type of premises	Uses per person	Litres used per customer
WC – public*	Pub/bar	1.0	
WC – public*	Pub/bar with sit down meals	1.0	
WC – public*	Nightclub	1.5	
WC – public*	Restaurant	1.0	
WC – public*	Bed and Breakfast	2.0	
WC - staff	Pub/bar	1.0	
WC - staff	Pub/bar with sit down meals	1.0	
WC - staff	Nightclub	2.0	
WC - staff	Restaurant	1.0	
WC - staff	Bed and Breakfast	2.0	
Taps in public WC	Pub/bar	1.0	2.0
	Pub/bar with sit down meals	1.0	2.0
	Nightclub	2.0	4.0
	Restaurant	1.0	2.0
Taps in staff WC	Pub/bar	2.0	4.0
	Pub/bar with sit down meals	2.0	4.0
	Nightclub	2.0	4.0
	Restaurant	2.0	4.0
	Bed and Breakfast	2.0	4.0
Taps in bar area	Pub/bar		2.0
	Pub/bar with sit down meals		2.0
	Nightclub		2.0
Taps in kitchen area	Pub/bar with sit down meals		5.0
	Restaurant		20.0
	Bed and Breakfast		5.0
Room taps- basin	Bed and Breakfast		12.0
Shower	Bed and Breakfast	1.0	See Notes
Note: * It was recognised that in most pubs and nightclubs WC use will be by women only as men will use the urinals. Therefore one visit per customer allows for two per woman customer A five minutes shower per guest is assumed in bed and breakfast establishment @ whatever flow rate recorded We assume 2 litres of water per hand wash pre-audit Urinals don't depend on customer numbers but on shut-down times of the premises			

Table 6.1

- Customer numbers are also difficult to calculate in pubs, but easier in nightclubs, restaurants, hotels, and bed and breakfast establishments. The predicted savings from the project were reliant on correct customer numbers from the owners or duty managers of the premises.
- The spreadsheet is designed to be easy to use. Information is input in various sheets and all savings are transferred to a summary page. Water, CO₂ and monetary savings for one year and five years from all the different low-cost and zero-cost measures are detailed on the summary page. The summary page can be sent to the premises highlighting the savings made under the project.
- The spreadsheet also shows potential savings if urinal controls are fitted, thus highlighting whether it would make economic sense for the premises to install these controls.
- Delegates were shown how the spreadsheet worked during the training day and there was also data input support by phone if required. One Local Authority reported they had found it confusing to use. However, the officer who ended up entering the data into the spreadsheet had not actually attended the official ech₂o training. Other feedback about the spreadsheet was overwhelmingly positive.

6.4 Partner Local Authority Water Savings

- Partner Local Authorities were given an extension to the original project end date of March 31st to April 30th 2008, and were asked to return all completed spreadsheets to ech₂o by May 9th 2008 for analysis and inclusion in the final report. Partner Local Authorities were also asked to submit a short report detailing their experience of the project by May 9th for inclusion in the final report. Not all partners were able to do this.
- ech₂o analysed all completed spreadsheets that were returned and have detailed the findings per Local Authority in the sections below. When reading the findings it is important to bear the following points in mind, especially when considering the great difference between the results for individual pubs or restaurants:
 - water efficiency measures implemented will have a far greater effect in larger premises with greater customer numbers
 - if premises already have controlled urinals, or no urinals, there will not be any potential savings from this measure
 - adjusting flow rates at kitchen taps in pubs and restaurants usually has a larger cumulative effect than adjusting flow rates at taps behind bars or in WCs
 - the cost of water varies between Local Authorities.

6.4.1 Aylesbury Vale District Council

- Sent two delegates to the training, one of whom carried out the water audits.
- Audited 12 premises, nine pubs and three restaurants.
- Premises located in Anglian Water and Thames Water areas.
- Aylesbury Vale has saved 545m³ of water and 327 kgCO₂ a year across 12 premises. If urinal controls were fitted in the 7 premises with uncontrolled urinals, a potential further 1,144m³ of water and 687kgCO₂ could be saved. Savings are detailed below.

Aylesbury Vale Total Savings per Year			
Premises	Water m³	Kg CO₂	£ (2008/09 rates)
Pub A	53.2	31.94	£84.59
Pub B	18.2	10.89	£45.68
Pub D	14.6	8.76	£23.21
Pub E	36.0	21.59	£90.36
Pub F	0.0	0.0	£0.00
Pub I	17.5	10.51	£43.93
Pub K	37.4	22.45	£59.47
Pub L	36.5	21.9	£91.62
Pub M	18.6	11.15	£46.69
Restaurant G	275.3	165.16	£437.73
Restaurant H	14.9	8.97	£23.69
Restaurant N	23.0	13.8	£36.57
Total	545.2	327.12	£983.54
Water supplied by Thames Water Utilities Ltd(£1.59) for all premises except Pubs B,E,F,I,L and M, which are supplied by Anglian Water Services Ltd (£2.51) .			
No water efficiency measures were implemented in Pub F			

Aylesbury Vale Savings from WC Flush per Year					
Premises	No. of WCs	No. of save-a-flush bags fitted	Water m³	Kg CO₂	£ (2008/09 rates)
Pub A	2	2	13.7	8.21	£21.78
Pub B	4	0	0.0	0.0	£0.00
Pub D	5	2	14.6	8.76	£23.21
Pub E	3	3	31.0	18.62	£77.81
Pub F	0	0	0.0	0.0	£0.00
Pub I	2	2	11.0	6.75	£27.61
Pub K	3	3	37.4	22.45	£59.47
Pub L	3	3	36.5	21.9	£91.62
Pub M	9	6	14.6	8.76	£36.65
Restaurant G	3	0	0.0	0.0	£0.00
Restaurant H	2	2	13.1	7.88	£20.83
Restaurant N	5	3	23.0	13.8	£36.57
Total	41	26	194.9	117.13	£395.55
Water supplied by Thames Water Utilities Ltd(£1.59) for all premises except Pubs B,E,F,I,L and M, which are supplied by Anglian Water Services Ltd (£2.51) .					
Pub F detailed in returned spreadsheet under WCs as "not Applicable"					

Aylesbury Vale Savings from Taps per Year				
Premises	Taps Adjusted	Water m³	Kg CO₂	£ (2008/09 rates)
Pub A	3	39.6	23.73	62.96
Pub B	15	18.2	10.89	45.68
Pub D	0	0.0	0.00	£0.00
Pub E	1	5.0	2.98	12.55
Pub F	0	0.0	0.00	£0.00
Pub I	2	6.6	3.94	16.57
Pub K	0	0.0	0.00	0.00
Pub L	0	0.0	0.00	0.00
Pub M	2	4.0	2.39	10.04
Restaurant G	6	275.2	165.16	437.57
Restaurant H	3	8.1	1.08	12.88
Restaurant N	0	0.0	0.00	0.00
Total	32	356.7	210.17	£598.25

Water supplied by Thames Water Utilities Ltd(£1.59) for all premises except Pubs B,E,F,I,L and M, which are supplied by Anglian Water Services Ltd (£2.51) .

Aylesbury Vale Potential Savings from Uncontrolled Urinals per Year			
Premises	Water m³	Kg CO₂	£ (2008/09 rates)
Pub A	133.7	80.25	212.58
Pub B	0.0	0.00	0.00
Pub D	394.2	236.52	626.78
Pub E	150.2	90.10	377.00
Pub F	75.9	45.52	190.51
Pub I	0.0	0.00	0.00
Pub K	138.4	83.06	261.24
Pub L	164.3	98.55	412.39
Pub M	0.0	0.00	0.00
Restaurant G	0.0	0.00	0.00
Restaurant H	87.6	52.56	139.28
Restaurant N	0.0	0.00	0.00
Total	1144.3	686.56	£2,219.78

Water supplied by Thames Water Utilities Ltd(£1.59) for all premises except Pubs B,E,F,I,L and M, which are supplied by Anglian Water Services Ltd (£2.51) .

6.4.2 Brighton and Hove City Council

- Sent one delegate to the training.
- Partnered with Southern Water¹⁶ who sent three delegates to the training, one of whom carried out the audits.
- Premises located in Southern Water area.
- Southern Water audited 20 bed and breakfast establishments in the city ranging from 5 to 20 rooms. The audit included an inspection of a variety of appliances including toilets, urinals, wash basins, WC's, showers, sinks, baths, and spa baths.
- Southern Water, on advice from their technical department decided not to implement any actual water efficiency measures during the audits. They advised owners and managers on what water saving improvements could be made. This included a variety of zero-cost and low-cost solutions or updating to more water efficient technologies where appropriate. Southern Water agreed to send water saving materials and resources such as the save-a-flush bag to those B&B's who required them.
- Neither Southern Water nor Brighton and Hove City Council were able to allocate any personnel to enter data onto the spreadsheets. Therefore, there were no findings to analyse, and no actual or potential savings can be detailed.
- Brighton and Hove City Council found that the hospitality sector were a particularly difficult sector to deliver to, mainly because of the limited time commitment they were able to offer to the auditor. Initial contact with the sector was via a letter that was sent to a variety of small hotels and B&B's. However, as this received next to no response the council officer responsible for coordinating the audits decided to call each of the premises instead. This type of personal communication seemed to more successful in reaching out to the industry, though it did prove to be rather time consuming.
- If free training and more support in delivery of the project could be made available, Brighton & Hove City Council is keen to continue the water saving project targeting the hospitality sector, and other sectors, in the city. However they would like ground level delivery support e.g. assistance with undertaking the audits or local training to encourage more personnel to be trained. Ideally this kind of a project would benefit from a whole team to be working together.

6.4.3 Crawley Borough Council

- Sent one delegate to the training.
- Supported ech₂o in implementing more water efficiency measures in data logged premises but carried out no work under their own auspices.

6.4.4 Lewes District Council

- Sent one delegates to the training, who subsequently carried out the water audits.
- Audited four premises, all pubs.
- Premises located in South East Water and Southern Water areas.
- Lewis District Council saved 218m³ water equating to 131kg CO₂ per year through installing save-a-flush bags and adjusting taps. One premises was given advice on installing electronic urinal controls.
- Completed spreadsheets for three premises were sent to ech₂o. Savings from the three premises are detailed below. All three premises already had urinal controls fitted so there are no potential savings from this measure to detail.

Lewis Council Total Savings per Year			
Premises	Water m³	Kg CO₂	£ (2008/09 rates)
Pub A	4.4	2.63	£9.99
Pub B	105.1	63.07	£240.68
Pub C	35.9	21.51	£82.21
Total	145.4	87.21	£332.88

Water supplied by Southern Water company (£2.29) for all premises except Pub A which is supplied by South East Water plc (Zone O Mid Southern £2.27) .

Lewis Council Savings from WC Flush per Year					
Premises	No. of WCs	No. of save-a-flush bags fitted	Water m³	Kg CO₂	£ (2008/09 rates)
Pub A	6	1	4.4	2.63	£9.99
Pub B	5	4	105.1	63.07	£240.68
Pub C	4	3	31.5	18.89	£72.14
Total	15	8	141	84.59	£322.81

Water supplied by Southern Water company (£2.29/m³) for all premises except Pub A which is supplied by South East Water plc (Zone O Mid Southern £2.27/m³) .

Lewis Council Savings from Taps per Year				
Premises	Taps Adjusted	Water m³	Kg CO₂	£ (2008/09 rates)
Pub A	0	0.0	0.0	£0.00
Pub B	0	0.0	0.0	£0.00
Pub C	2	4.4	2.63	£9.99
Total	2	4.4	2.63	£9.99

Notes: Water supplied by Southern Water plc (£2.29/m³) for all premises except Pub A which is supplied by South East Water plc (Zone O Mid Southern £2.27/m³) .

- Lewes District Council will continue this project in a slightly different guise as energy advice will also be given. They have plans to continue with pubs this year and then focus on different premise types in the future eventually expanding beyond the hospitality sector.

6.4.5 Maidstone Borough Council

- Sent three delegates to the training
- They council subsequently decided that they had no time in the current financial year to carry out audits within their hospitality sector, and also not enough spare staff capacity.
- Maidstone Borough Council might run the project independently in the future. They would be more likely to run it if a partial contribution towards the costs of the participating organisations were available. The inclusion of carbon reduction, adaptation, flood and water and fuel poverty indicators in the next Local Area Agreement is likely to increase their participation in an initiative like this.

6.4.6 Medway Council

- Sent one delegate to the training, who carried out the water audits.
- Audited six premises, four social clubs and two pubs.
- Premises located in Southern Water and Three Valleys Water areas.
- Medway's approach to engaging with the Hospitality sector was to circulate a letter to all public houses and licensed premises inviting them to be part of the water audit project. Given the limited resources and time this was felt to be the best and most cost effective way of making that initial contact. Letters were sent out to the 200 licensees or managers identified from previously collated data containing all businesses in Medway. From the initial mail-out 7 licensed premises responded and were interested in the taking part in the project. Overview low-cost and zero-cost measures implemented are detailed below.

Pub A	All Hallows	Public House	Licensees pulled out of the project due to family problems	
Social Club B	Rainham	Sports and Social Club	Water flow adjustments	Save-a-flush Fitted - Advice on Urinals
Social Club C	Cliffe Woods, Isle of Grain	Sports and Social Club	Advice on Urinals and alternative taps	Premises were being refitted in near future
Pub D	Rochester	Public House	Water Flow adjustments	Save-a-flush fitted
Social Club E	Gillingham	Social Club		Advice on Urinals, Save-a-flush Fitted
Pub F	Rainham	Public House	Water Flow adjustments	Save-a-flush Fitted
Social Club G	Rochester	Social Club	Water flow adjustments	Advice on Urinals

- The initial reaction to the project from premises in Medway was very positive; with more time to devote to this project it may have been possible to have generated a broader publicity campaign in order to encourage more licensed premises to take part. Each of the project sites visited were very interested in the concept of the project, and were willing to spend time to learn how to implement the low-cost and zero-cost water efficiency measures. They were also interested in how implementing these measures could save them money.

- In general the project raised awareness of water issues and generated a positive attitude to saving water in the premises audited.
- Six completed spreadsheets were returned to ech₂o for analysis.
- Medway Council has saved 232m³ of water and 139 kgCO₂ a year across six premises. If urinal controls were fitted in the two premises with uncontrolled urinals, a potential further 342m³ of water and 205 kgCO₂ could be saved. Savings are detailed below.

Medway Council Total Savings per Year			
Premises	Water m³	Kg CO₂	£ (2008/09 rates)
Social Club B	36.5	21.90	£83.59
Social Club C	6.20	3.72	£14.20
Pub D	101.6	60.96	£232.66
Social Club E	35.4	21.24	£ 81.06
Pub F	20.4	12.24	£46.95
Social Club G	32.0	19.14	£73.28
Total	232.20	139.20	£531.74
Water supplied by Southern Water company (£2.29/m ³) for all premises.			

Medway Council Potential Savings from Uncontrolled Urinals per Year			
Premises	Water m³	Kg CO₂	£ (2008/09 rates)
Social Club B	159.2	95.55	£364.57
Social Club C	0	0	£0.00
Pub D	0	0	£0.00
Social Club E	0	0	£0.00
Pub F	0	0	£0.00
Social Club G	182.7	109.63	£418.38
Total	341.9	205.2	£782.95
Water supplied by Southern Water company (£2.29/m ³) for all premises.			
If no potential savings detailed, premises either had controlled urinals or no urinals			

Medway Council Savings from WC Flush per Year					
Premises	No. of WCs	No. of save-a-flush bags fitted	Water m³	Kg CO₂	£ (2008/09 rates)
Social Club B	10	10	21.9	13.14	£50.15
Social Club C	7	3	2.2	1.31	£5.04
Pub D	5	5	73.0	43.8	£167.17
Social Club E	4	3	21.9	13.4	£49.71
Pub F	8	8	11.0	6.57	£25.19
Social Club G	3	3	18.3	10.95	£41.91
Total	37	32	148.3	89.17	£339.17
Water supplied by Southern Water company (£2.29/m ³) for all premises.					

Medway Council Savings from Taps per Year				
Premises	Taps Adjusted	Water m³	Kg CO₂	£ (2008/09 rates)
Social Club B	2	14.6	8.76	£30.51
Social Club C	3	4.0	2.42	£9.16
Pub D	3	28.6	17.14	£65.49
Social Club E	2	13.5	8.09	£30.92
Pub F	16	9.5	5.69	£21.76
Social Club G	3	13.7	8.21	£31.37
Total	29	83.9	50.31	£189.21
Water supplied by Southern Water company (£2.29/m ³) for all premises.				

6.4.7 Reigate and Banstead Borough Council

- Partnered with Sutton and East Surrey Water, who were the lead partner in this project. Sutton and East Surrey Water sent one delegate to the training. Audits were carried out by other company personnel who did not attend the training.
- Premises located in Sutton and East Surrey Water areas.
- By the project end date no details had been received about the number of premises audited. Last correspondence with Sutton and East Surrey Water (early April) was that it was hard to arrange access to premises but that they were still hoping to meet the project end date. Since then, emails and phone calls from both ech₂o and the council have elicited no response about how the audits are progressing.
- Did not submit audit spreadsheets. No savings to detail.
- Reigate and Banstead Borough Council are keen for Sutton and East Surrey Water to complete 20 audits to realise water savings within their hospitality sector.

6.4.8 West Sussex County Council

- Sent one delegate to the training, the Water Matters Project Officer.
- Due to internal staff changes he was moved to another department before he undertook any audits and role was changed to that of Climate Change Officer.
- At present West Sussex County Council are unlikely to address water use in the hospitality sector in 2008/09.

6.5 Conclusions

- Partner Local Authorities found that the training and tools provided by ech₂o gave them the confidence to carry out the audits and implement the low-cost and zero-cost water efficiency measures successfully.
- Savings from this part of the project were less than had been hoped for. Partner Local Authorities found it difficult to allocate enough staff resources to the project to complete audits on 20 premises.
- A longer lead in time to carry out any future such project is imperative.
- Most of the partners said they will continue with this project in the future in some form.
- Several partners said they would like to have more funding from SEEDA allocated to a project such as this that allowed for more support from an outside body such as ech₂o.
- Did the lack of a hosepipe ban make it more difficult to engage the hospitality sector? This may have made it harder to arrange access to premises as saving water is not seen as that important by the general public at present.
- Did the lack of a hosepipe ban make it more difficult to engage partners? Maidstone Borough Council when they dropped out of the project commented that “there may be a slight factor that we are no longer in a drought and so with our short memories other priorities take over.”
- Partnering with local water suppliers is good but initial contact probably needs to be made by the council. Sutton and East Surrey Water found it difficult to arrange access to visit premises.

7 Working with chains to become water efficient

- Chains within the hospitality sector have premises that are widely distributed and managed in a variety of different ways. In many chain premises duty managers do not have the authority to make decisions that affect front-of-house situations. Therefore, management barriers are often a major issue in implementing water saving measures, especially with local projects that have a short time-scale.
- Obviously, if a chain can be persuaded that water efficiency is a serious strategy to address, and implemented across all their sites nationwide, then large cumulative savings will be made.
- As water bills are usually sent directly to head office, working with chains at head office level would allow analysis of average usage for different premises over a period of time.
- During the Saving Water in Crawley's Hospitality Sector project, we were often only able to fit save-a-flush bags in staff toilets of many of the chain restaurants and pubs; the duty managers or staff were unable to give authorisation to fit them elsewhere without head office approval. Total estimated savings from save-a-flush bags fitted in Crawley are 1,146m³ per year. If approval had been forthcoming while we were on site to fit save-a flush bags in all chain-owned premises, a further 635m³ of water a year could have been saved. Follow-up calls in November and December 2007 showed that, in the nine months since the original audit, no chains had followed the advice to fit the bags. This further highlighted the need to engage chains at head office level to get even zero-cost water efficiency measures implemented.

7.1 The project remit

- The project brief was to understand the reasons that prevent corporate chains from becoming water efficient. We wanted to engage with two chains at upper management level to analyse what their sector needs to champion water efficiency.
- Ideally one of the businesses would be a nationwide branded chain so that water efficiency would become part of their corporate strategy and part of their overall recognised brand.
- Educating head office about the best water efficiency measures to use, and in what particular situation, is key in ensuring confidence in their effectiveness. It was therefore felt that in-house training on both water and carbon efficiency would be something that chains would welcome.
- The chains targeted all owned pubs or restaurants in the Crawley area that had been audited under the original Saving Water in Crawley's Hospitality Sector project. They were:
 - Mitchell and Butler
 - Sprit Group (Punch Taverns)
 - Hall and Woodhouse
 - Orchid Pub Company
 - Laurel Pub Company
 - Tragus Ltd
 - Jack Beards
 - Tattershall Castle Group
 - The Restaurant group
 - Nando's
 - Gondola Group

- We especially wanted to work with the Spirit Group as between August 2004 and June 2005 they had reduced water consumption by more than 36% over 225 of their properties (45% of their business portfolio).¹⁷ They have a carbon manager and have been working with the Carbon Trust since June 2007 to reduce their carbon footprint, so are clearly a company that takes sustainable issues seriously. Unfortunately, RK (the carbon manager) was on maternity leave and no one person in particular had been tasked to take over her position.
- We had built up a good relationship with publicans or duty managers at the local level in Crawley, but most of them did not have direct contact with head office but only with their local area managers. Therefore, we had no personal contact with head office and had to, in effect, cold call them.
- We spoke to reception desks to locate the relevant person in the company who deals with issues of sustainability and got a range of haphazard departments to contact ranging from recycling to business procurement. A number of companies released a name and directed us to a general hub email address for that person but would not connect us by phone. The telephone calls (and therefore we also assume the emails and attachments) were generally treated as a sales pitch and in all probability filtered out rather than being passed to a relevant person.
- Discussions with personnel highlighted the fact that most companies understand the message about energy savings but saving water still seemed to be peripheral. There were also comments about it was head office policy not to fit urinal controls because of odour problems.
- We ultimately had close contact with two chains.

7.2 Chain 1

- Chain 1 owns approximately 25 premises (all pubs) within the M25 area. We liaised with their business manager (WA).
- Our initial discussions with WA centered on his resentment toward the local water supplier who had told them they had to install urinal controls in two of their premises. WA's argument was why should they save water when the water companies waste so much. We were able to discuss issues of water efficiency with him and offered to detail how much water he could potentially save by fitting urinal controls. For this we required data about the number of urinals within the premises, which head office did not have. We offered to contact the premises under the project auspices, but this offer was never taken up.
- We offered to spend a day at their head office analysing bills with WA. He felt this would be useful but was not able to arrange access to the data within the time-frame of the project. WA did not feel that training in water efficiency would be useful to the company.
- We arranged delivery of 200 save-a-flush bags from Thames Water to head office and WA will arrange for his maintenance staff to fit them in all suitable WCs. He considered that almost all of their WCs would be suitable, as none of their premises had been refurbished since 2001. He estimated they had 200 WCs across their premises, but was unable to supply customer numbers so savings can only be estimated.

- As a result of fitting save-a-flush bags in all of their 25 premises we estimate an average saving of 30m³ per pub (as some premises are large and some small) totaling 750m³ per year.

7.3 Chain 2

- Chain 2 is a major chain owning branded restaurants across the UK. It has recently begun to work with the Carbon Trust to reduce its carbon footprint. Discussions highlighted the fact that water was not being covered under the Carbon Trust programme and therefore this project would dovetail nicely with it. We liaised with their training manager (RE).
- Following a meeting with Chain 2 we offered to carry out a selection of the measures below. They were to:
 - carry out an audit of one of their premises (in effect an “average” Chain 2 restaurant) which would be used as an example as to the amount and type of savings that could be made across all their branches,
 - supply a report to highlight both good and bad practices in the audited restaurant,
 - supply a spreadsheet that shows the current savings (detailed in m³ of water, kg of CO₂ and £) made at the premises from any water efficiency measures currently installed,
 - supply a spreadsheet that shows the potential savings (detailed in m³ of water, kg of CO₂ and £) that could be made at the premises from any water efficiency measures subsequently installed,
 - adapt the spreadsheet further to calculate information useful to Chain 2,
 - work with the staff group analysing bills from a selection of premises to calculate water per customer and to highlight good practice and bad practice establishments,
 - write some simple tips for saving water at work and saving water at home for their workforce
 - write some simple water efficiency guidelines for a new build and retrofit situation relevant to their restaurants,
 - to suggest ways to add “water efficiency” into the general training pack¹⁸ which they are doing at present with energy efficiency.
- RE was very keen to engage with ech₂o under this project. However, the restricted time scale for an organisation of their size and the required tie-in by different levels of senior staff meant that ultimately their participation did not happen. However, their discussions with ech₂o about the savings made in Crawley from implementing low-cost and zero-cost measures has meant that they are very likely in the near term future to implement a sustainable water strategy for their organisation and to carry out water efficiency measures in all their restaurants.

7.4 How important is water efficiency to chains?

- The low level of importance in which water efficiency is currently held by most chains is probably best summed up by the following example. A nightclub that we were logging was shut down in August 2007. Analysis of water use showed that even when the premises were shut 3000 litres of water was being used per day. Closer analysis of the data downloads showed that this usage was most probably from urinal sanitary flushing. Most urinal controls will allow a sanitary flush every 12 hours, but the urinals were flushing every four hours in this establishment.

- The company was contacted by phone, and an email and letter sent to the area manager (and copied to the CEO) to alert them to the wastage of water. which was 90m³ of water per month, costing £208 at Southern Water's price of £2.27 per m³. We offered to meet them on site under the project auspices to confirm if it was indeed a faulty sanitary urinal flush. We also asked them to confirm they had received the email or letter. We received no response and therefore do not know whether the company has acted on the advice.

7.5 Conclusions

- It was extremely difficult to engage chains in the hospitality sector in buying into waster efficiency. Saving water is currently not seen as that important. Engaging the corporate sector to implement water efficiency would be far easier if there was another drought!
- A tie-in is required between water and carbon as chains are beginning to understand the need to reduce their carbon footprint. . There is little realisation that reducing water use will also reduce a business's carbon footprint.

8 Conclusions

- The tight time-scale of the project resulted in less water savings than estimated and made it difficult for some Local Authorities and chains to be part of the project.
- Eight Local Authority partners, two Water Supply Companies, and two chains operating in the hospitality sector engaged with the project. All partners suggested that results would have been better if the project had continued over a longer time span.
- Seven Local Authority partners and two Water Supply Companies were trained to repeat the success of the Crawley project. Delegates that had attended the training felt sufficiently competent to audit premises within their own hospitality sectors, and to implement low-cost and zero-cost water efficiency measures.
- The partnership between Water Companies and Local Authorities is an excellent model and should be encouraged in future projects.
- The spreadsheet designed by ech₂o enabled savings to be analysed between different premises and different Local Authorities.

8.1 Total savings from the project

- In some premises retrofitting urinal controls did not have as great an impact on water savings as had been calculated. After controls were fitted, water for urinal flushing decreased when the premises were shut but increased when the premises were open.
- Savings from the project are spread across different sectors and can be further divided into those that have actually been made and potential savings.
- Total water savings achieved under this project by April 2008 are calculated to be 2812m³ of water across 51 premises, an average saving of 55m³ of water per premises per year.
- **2812m³ of water saved is 3374 kWh of energy saved, resulting in 1687 kgCO₂ not emitted**

8.2 Savings from Local Authority partners

- Just three out of eight Local Authority partners actually implemented any water efficiency measures before the project end date.
- Aylesbury Vale District Council saved 545m³ of water, 327kgCO₂, £984. Savings were made across ten premises. Water was supplied by either Thames Water at a cost of £1.95 per m³ or Anglian Water at a cost of £2.51 per m³.
- Lewes District Council saved 145m³ of water, 87kgCO₂, £333. Savings were made across three premises. Water was supplied by either Southern Water at a cost of £2.29 per m³ or South East Water at a cost of £2.27 per m³.
- Medway Council saved 232m³ of water, 139kgCO₂, £532. Savings were made across six premises. Water was supplied by Southern Water at a cost of £2.29 per m³ for all premises.



- **Total savings achieved from water efficiency measures implemented by three Local Authority partners are calculated to be 922m³ of water and 553 kgCO₂ per year.**
- Further high volumes of water savings are expected by the end of March 2009 as a direct result of partners' engagement in this project. Seven of the partner Local Authorities will continue to encourage low-cost and zero-cost water efficiency measures to be installed in their areas across all sectors, not just the hospitality sector.
- Brighton and Hove City Council, Maidstone Borough Council and Reigate and Banstead Borough Council expect to make initial savings during the 2008/2009 financial year.
- Lewes District Council and Medway Council expect to make further savings during the 2008/2009 financial year.

8.3 Savings from chains

- One chain agreed to install save-a-flush bags across all their premises within the M25 area. **Total water savings achieved from this measure are calculated to be 750m³ of water and 450 kgCO₂ per year.**
- The second chain, (a national restaurant chain) following their discussions with ech₂o about the savings made in Crawley from implementing low-cost and zero-cost measures are very likely in the near term future to implement a sustainable water strategy for their organisation and to carry out water efficiency measures in all their restaurants.

8.4 Savings from ech₂o further work in Crawley

- ech₂o carried out a series of further low-cost and zero-cost water efficiency measures across the ten data logged premises in Crawley.
- **Total savings achieved from further water efficiency measures implemented by ech₂o are calculated to be 1140m³ of water and 684 kg CO₂ per year.**

8.5 Suggested future work

8.5.1 With Local Authorities

- To train and support a further six Local Authority partners across the south east region to initiate low-cost and zero-cost water efficiency measures within their local hospitality sector.
- To analyse further the water audits carried out by partner Local Authorities and these to continue to compile savings made from low-cost and zero-cost water efficiency measures from this project across the south east.

8.5.2 With Chains

- To continue to engage with chains in the hospitality sector to directly influence them to initiate low-cost and zero-cost water efficiency measures.

8.5.3 General

- To continue to access data from the functioning data loggers to analyse further water use and the effectiveness of water efficiency measures within the hospitality sector.

- To research further the result that retrofitting urinal controls did not actually save as much water as calculated.

¹ The original estimate of CO₂ not emitted, was 2,735 kg. This lower figure was because we used the official conversion figure at that time of 0.45 kgCO₂/kWh.

² Flushing volumes were generally lower in disabled WCs as many had been recently refurbished, (presumably to conform to the revised Part M of the Building Regulations).

³ We had felt that was important and had a turn around time of 2 weeks for reports following audits, but sometimes this slipped.

⁴ This comment was in relation to recommendations for water efficiency measures at the refurbishment stage

⁵ It is recognised that not all the increased water awareness was due to the ech2o audit and report. The need to save water is still quite prominent in local and national press.

⁶ Subsequent analysis of the data logged sites showed that this increased standard of hygiene may be resulting in higher water use when the premises are open and that water savings are therefore not be as great as predicted. A lot of premises have the inlet valve almost closed in an effort to save water and therefore urinals are flushing at less than 7.5 litres an hour.

⁷ Some of the chain restaurants had customer numbers analysed by head office as part of performance rating. The nightclubs had figures as they had to limit numbers due to fire regulations.

⁸ A confidential report has been prepared for SEEDA detailing the problems with the data loggers

⁹ As above, a confidential report has been prepared for SEEDA detailing the problems with the data loggers

¹⁰ The extra usage at this pub was due to increased flushing when the pub is open.

¹¹ On the evening of the 1st April following advice from ech2o, the publican' arranged privately for the flow rate at the inlet valve to the urinal to be manually reduced.

¹² We allocated a short underspend from working with chains to fund the fitting of these controls.

¹³ Flow rates at kitchen taps were reduced on average by 41%. The potential for savings is very high. Further empirical evidence is required to analyse how accurate the figure of 304m³/year proves to be.

¹⁴ It was not as great as anticipated. We have identified this as due to increased flushing of the urinals (after the urinal controls were fitted) when the premises are open than before; this effect has reduced the overall estimated savings from fitting urinal controls.

¹⁵ 2001 was the year the maximum flushing volume was reduced to 6 litres, and 6/4 dual flush WCs were widely available on the UK Market.

¹⁶ Without the support of Southern Water, Brighton and Hove City Council would have been unable to participate in the project despite their desire to, due to lack of identified personnel with the time to carry out the audits

¹⁷ Interestingly, our audits showed that they managed one of the most poorly performing premises in Crawley, whose duty manager had told us her boss was not interested in water efficiency.. We were interested in understanding why the message had not reached this particular establishment.

¹⁸ We also offered Chain 2 water efficiency and carbon efficiency training for the core staff group but RE felt that this option would be of more use to the company.



ech₂o
Unit 7, Temple Yard
Temple Street
London E2 6QD

020 7729 2819

info@ech2o.co.uk
www.ech2o.co.uk

ech₂o work with local authorities, developers, housing associations, architects and engineers, at both a strategic and individual site level, to successfully incorporate sustainable water and low carbon solutions into the built environment.

