

Saving Water: Make it Your Business Sub Meters and Smart Metering

With South Australia facing water supply and management challenges we all need to ensure we use water as wisely as possible. By conserving water your business will not only save money, but assist South Australia to secure water resources for our future.

The best way for business operating multiple processes to achieve water reductions is to understand how, when and why water is used. Installing sub metering systems is the first key component to tracking water consumption and improving water use efficiency.

The Water Services Association of Australia (WSAA) has identified that being able to measure where water is being used, through the installation of additional meters and data loggers, is fundamental foundation of every successful water efficiency program (WSAA, 2009).

SA Water charges customers by periodically reading boundary water meters that accumulate usage over time. This method will provide accurate consumption readings over a monthly or quarterly period but doesn't track behaviour or water use patterns. High water use times and possible water wastage are averaged out over a month or quarter and water usage will be assumed to be normal.

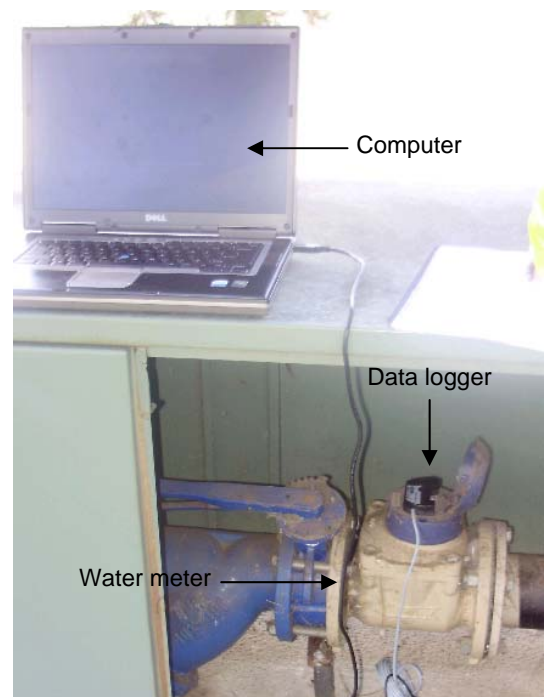
Sub meters

To accurately track water consumed in multiple high use areas each production area requires isolation with a separate meter. Isolating individual production areas (sub metering) identifies exactly where and how much water is used throughout various operations on site. This information can be used as a guide to determine high use areas, unexplained increases and potential issues. Water minimisation projects can then be directed at specific areas. Savings achieved are measured accurately through sub meters and will justify water saving initiatives.

An overall site water balance can also be developed by regularly monitoring sub meters and comparing incoming water use with effluent discharged. This can highlight process water and product losses.

What is smart metering?

A smart water meter is basically a conventional water meter linked to a data logger (device that allows continuous electronic recording of pulse outputs from your meter). The number of pulses captured is recorded with each pulse representing a specific volume of water, determined by the specification of your water meter(s). Telecommunications technologies make it possible to bring this signal to a computer, removing the need to manually read the meter, especially helpful if you are tracking multiple sub-meters on site.



Data logger connected to water meter and laptop

Further information

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Records from the data logger can be downloaded over set periods of time and water consumption information can easily be graphed and analysed.

Smart metering can enable remote and continuous analysis of water consumption. This helps identifying the average or typical water use in each area and if there are any baseline flows (therefore highlighting leaks/fluctuations previously unidentified). Alarms can also be set (i.e. > 100 litres per minute for longer than 5 minutes) to inform key staff, avoiding/minimising costly water wastage. Real time analysis allows users to match up water use with specific process operations, drawing attention to times of high water use that may have previously gone unnoticed.

Base flow

Leaks can be identified by determining the base flow or the constant flow of water through the meter when all activity has ceased on site or during operating hours where base flow doesn't return to zero, and is at a constant flow rate.

An example of how a data logger can identify base flow is detailed below in Figure 1. As displayed the logger is never recording '0' use through the meter, with the minimum value recorded at approximately 6 litres per minute. Over a year this equates to approximately 3,000kL of wastage. Logging your meter can identify significant water wastage that would otherwise be unnoticed and helps you to save money.

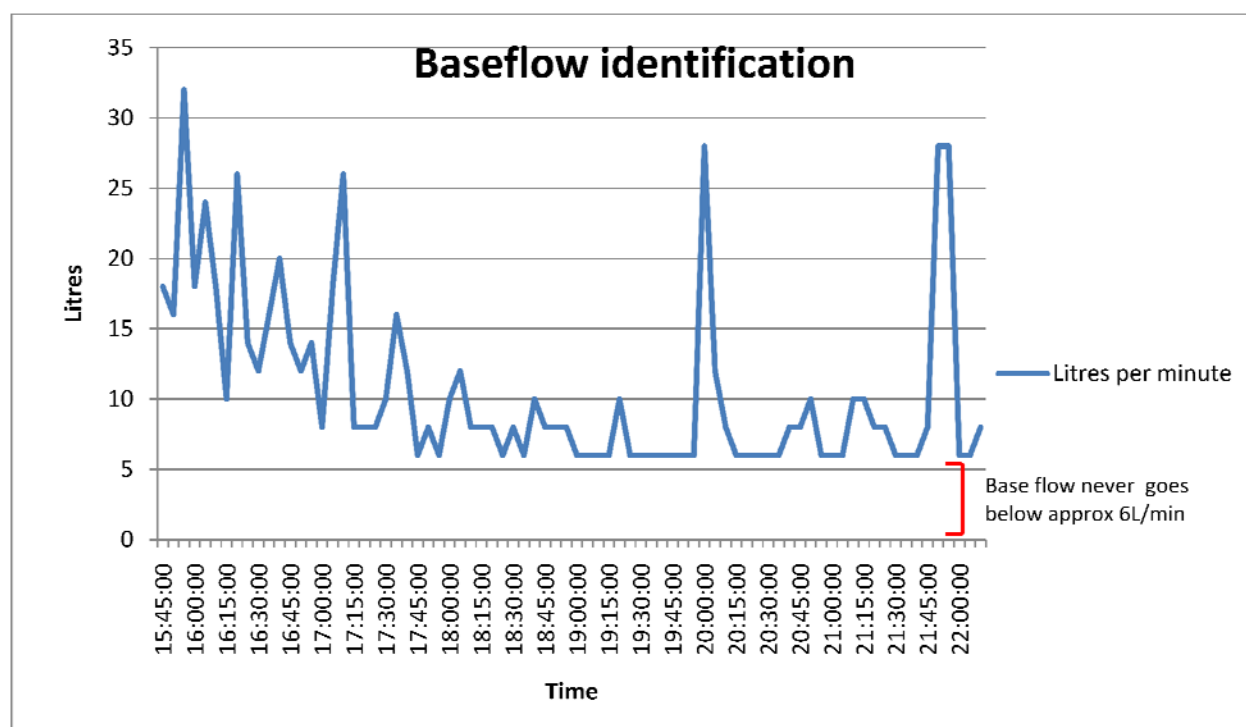


Figure 1: Example of how a leak is easily identifiable when using a data logger.

Case study 1 – Sub meters

A local Adelaide business sub metering project demonstrated how effective the metering of individual process areas can be in improving water efficiency. Fourteen reconditioned sub meters were installed and then read on a daily basis enabling a detailed water use analysis and water balance to be completed. A number of water saving projects were then identified and implemented, as the savings achievable were measurable. Figure 2 details the water use analysis through six of their sub meters. Consumption spikes and low points were highlighted and investigated. These fluctuations in consumption would not be evident through reading boundary mains water meters alone. Even if they were read daily, only a slight difference in consumption would be recorded.

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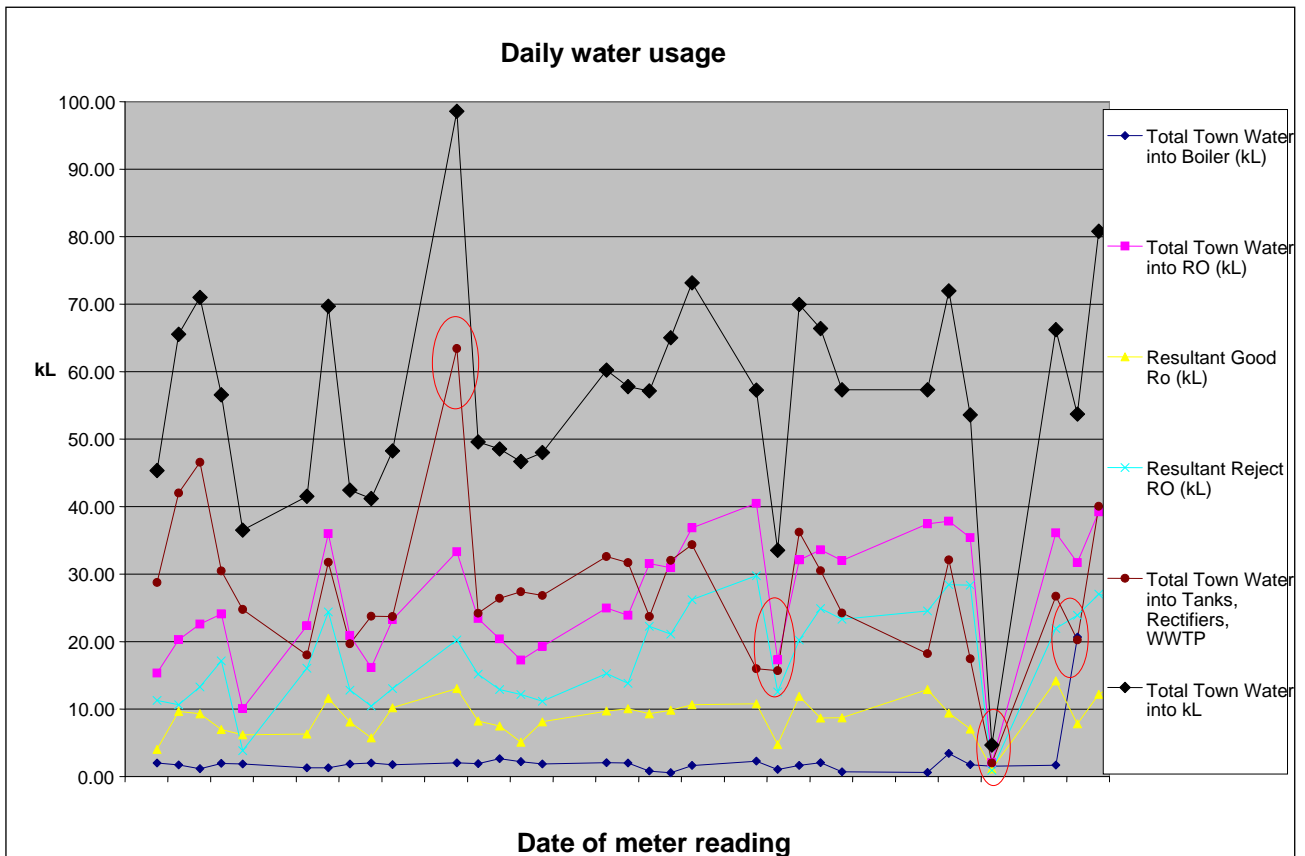


Figure 2: Sub meter water use analysis

Case Study 2

Figure 3 details daily water consumption by the hour on eight separate days at a large scale Adelaide manufacturer. This data was collected during an SA Water Business Water Saver Audit and allowed us to compare process water use during a week of operation to the same daily manufacturing process. This analysis highlights production inefficiencies by indicating high water using processes and increases in water volumes required to conduct the same process on different days. These inefficiencies were then investigated and operating procedures altered accordingly. Without this level of information, production inefficiencies could not be identified.

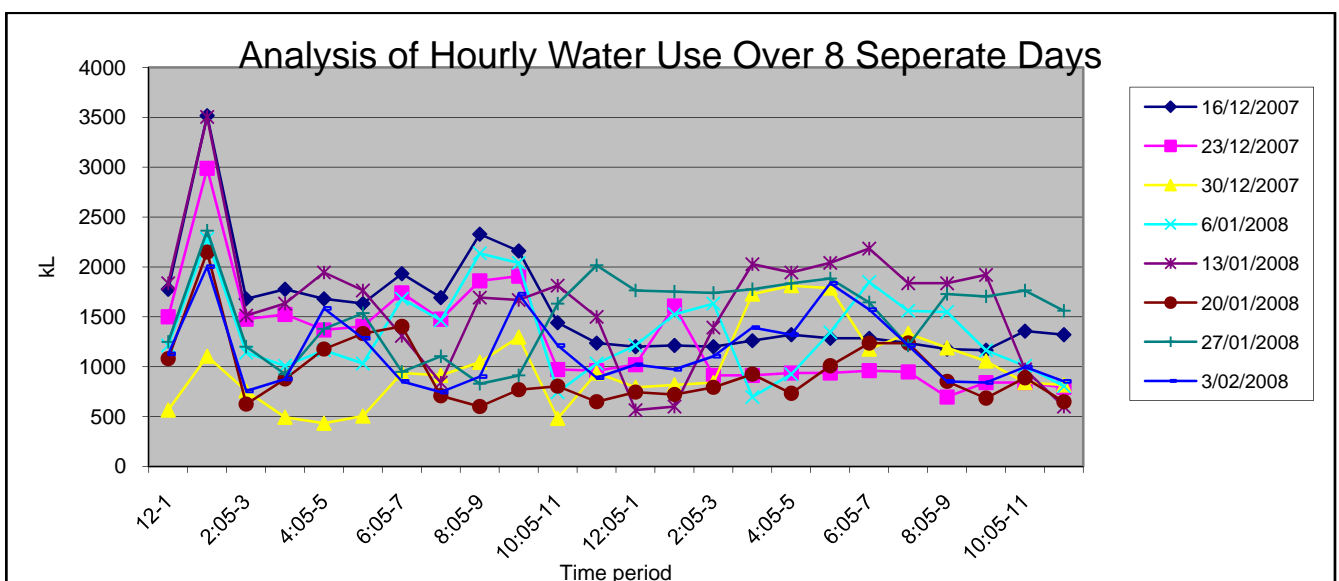


Figure 3: Analysis of water use over 8 days by the hour

So what are the overall benefits for your business?

- If you don't track it you can't manage it.
- A smart meter displays water consumption in real time.
- Alarms can be set to highlight excessive use.
- Fluctuations can be identified immediately allowing staff to take action.
- It identifies how much water is being used in individual processes, allowing water saving efforts to be directed at high use areas.
- Improves the decision making process for the allocation of capital works as expected savings are based on actual data as opposed to guess work.
- Expected water reduction savings can be based on data ensuring water minimisation projects are implemented successfully.

Always remember that monitoring alone will not improve your business water efficiency. Monitoring should always be followed by careful analysis of water and production information and an effective maintenance program.

References

WSSA Occasional Paper No. 23, May 2009. Meeting Australia's water challenges - Case studies in commercial and industrial water savings.

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