Water saving initiatives introduced across Northern Health

Sharon McNulty – Director, Facilities Management, Northern Health

Bundoora Extended Care Centre

Broadmeadows Health Service

Craigieburn Extended Care Centre

Panch Health Service

Northern Health is a Victorian health service which has five main facilities. The facilities are Broadmeadows Health Service (BHS), Bundoora Extended Care Centre (BECC), The Northern Hospital (TNH), Craigieburn Health Service (CHS) and Panch Health Service (PHS). While Northern Health has five facilities the newest facility, CHS, only opened in late April 2006.

Northern Health provides healthcare to the expanding communities in Melbourne's northern suburbs, and the rural areas beyond. A unique mix of services are provided including medical, surgical, emergency, intensive and coronary care, paediatrics, women's and maternal health, mental health, aged care, palliative care and rehabilitation programs.

When the Stage One water restrictions were introduced for Melbourne, Northern Health reviewed their water usage and changed work practices accordingly. Practices such as watering gardens and external footpath cleaning were reduced and eliminated wherever possible, however Northern Health felt that it could contribute more to conserving this scarce resource.

In 2004 Northern Health made a socially conscious decision to review its water consumption across four campuses (BECC, BHS, TNH & PHS). CHS was not included as the facility had not been built at this stage. Given the global water crisis and drought in Victoria, the water saving initiatives were not only a necessity for the environment but a socially responsible concept as well. The primary drivers of the project were:

- Victorian Government target of reducing water consumption by 15% by 2006
- the need to reduce recurrent costs;
- environmental responsibility

In addition there were two other objectives of the project and they were:

- implementation of water saving initiatives whilst ensuring complaints from reduced water pressure was not an issue amongst patients and staff;
- development of a system for monitoring the outcomes of the projects to ensure they were achievable and sustainable.

The Northern Hospital

Over the years, Northern Health has implemented a number of initiatives to reduce its water consumption. The above principles have been applied throughout all of these projects.

Initiatives

Water Efficiency Audit

In 2004 Northern Health engaged the services of a water efficiency auditor to undertake the following tasks:

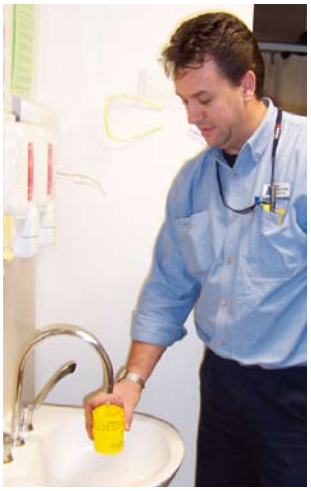
- assess and measure all areas using water
- identify and quantify water use
- complete a water balance between the calculated use and actual usage to within 10%
- identify water efficiency options, savings and costs of installation of any recommended measures and the estimated payback periods
- prioritise water saving recommendations
- identify hot water energy savings

It took approximately eighteen months to complete the audit and implement the recommendations across all sites. This period included time for the evaluation of the initial pilot site and subsequent approval to proceed with the implementation at the other three sites.

The water efficiency audit involved the auditing team firstly locating and assessing flow rates from all water use appliances. Appliances included taps, vanity basins, urinals, showers, sinks, sterilisers, troughs, dishwashers, washing machines and wash down taps. The chief auditor then calculated the volume of usage based on the type of appliance and usage figures, measurements available, discussions with staff on usage frequency and duration and assumptions based on experience.

The various usage rates were compared with private and public databases available for suitable types of facilities. The water heating systems, plumbing installation and pumping systems were also inspected and observed.

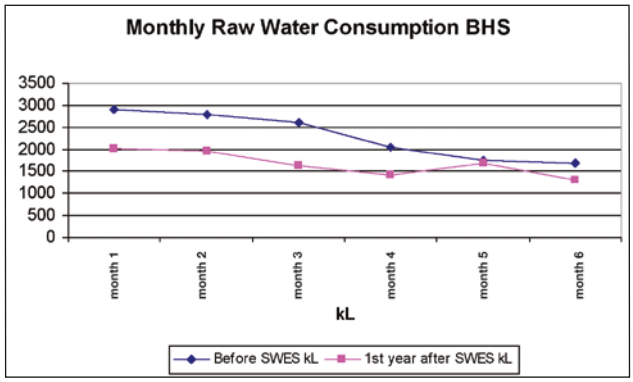
During the audit the flow rate of each sink and shower was tested. The majority of flow rates in vanity basins were found to be in excess of 12 + L/min. Splashing and user wetting were common at this flow rate. In Australia 6 L/min is the flow rate recommended by most water authorities for vanity basins. Onsite testing indicated that 6 L/min was a very presentable flow. The volumes of water delivery from most sinks and troughs were measured at about 15 L/min for both hot and cold water. The recommendation for sinks was 9 L/min. Measured flow rates for the showers were generally excessive for that required for the showerhead and showering purposes. Flow rates ranged from 15-20 L/min for either hot or cold with combined hot/cold flow rates of 20 + L/min. It was recommended that showers have flow control valves installed thereby reducing the flows to the standard 12 L/min.



Vanity basin testing

Shower testing

In total, the installation of 2441 flow control valves was recommended across the four campuses, with the total estimated savings of 20,611,000 litres of water per annum across three campuses (PHS had just opened and had no historical data to predict savings on). This equated to a $44,500 annual saving in recurrent expenditure, with a payback period of two years.



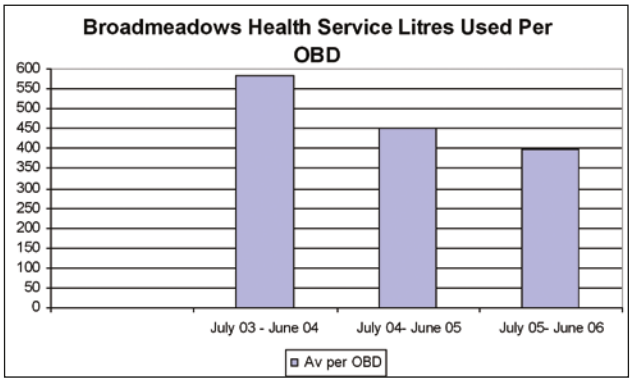
Graph 1 – Raw data comparative water consumption BHS (pilot site) before and after flow control valve installation.

Northern Health needed to ensure that the recommendations would deliver the predicted savings, return on investment, that the changes were sustainable and the implementation had no impact on the quality of patient care provided before proceeding with the recommendations at all sites. The Northern Health CEO approved a pilot to trial the installation of flow control valves at one Northern Health campus. Broadmeadows Health Service was chosen as a pilot site to predict whether the savings were achievable and sustainable

and it was agreed that data would be reviewed after six months to determine if the project would proceed at the other three campuses.

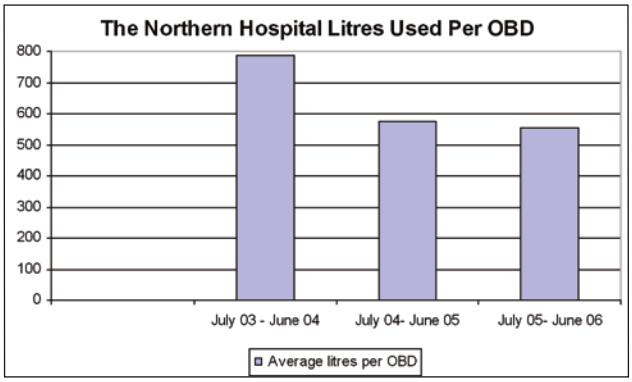
The post implementation results showed a total reduction at BHS by 19% (4,721,000 litres). Based on these results, the CEO approved the works to be completed at the three remaining campuses.

Post Implementation Evaluation



Graph 2 – Water savings per Occupied Bed Day – Broadmeadows Health Service

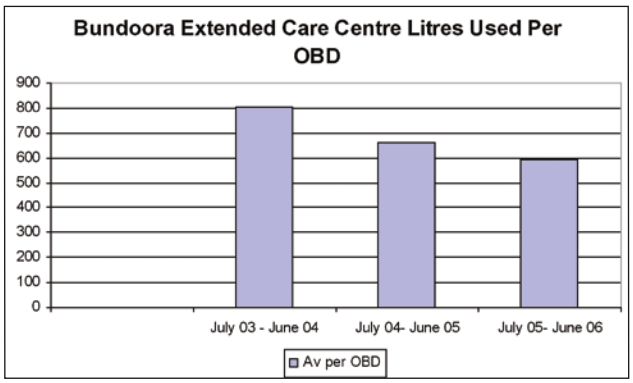
Following the installation of the flow control valves, BHS reduced its usage from 584 litres per occupied bed day in 03/04 to 452 litres per occupied bed day in 04/05 to 396 litres per occupied bed day in 05/06. This equates to an average usage of 477 litres per occupied bed day in the two years since the flow control valves were introduced (or a 27.38% reduction).



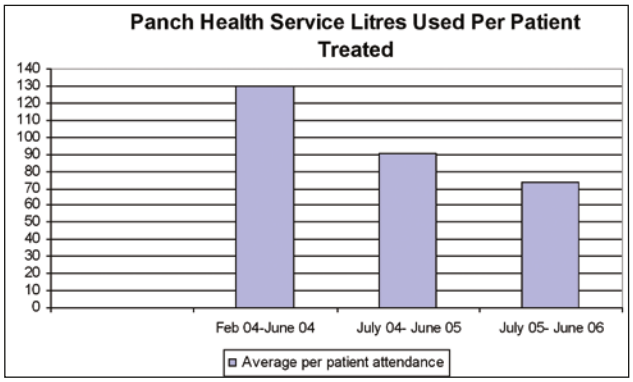
Graph 3 – Water savings per Occupied Bed Day - The Northern Hospital

Following the installation of the flow control valves, TNH reduced its usage from 788 litres per occupied bed day in 03/04 to 573 litres per occupied bed day in 04/05 to 553 litres per occupied bed day in 05/06. This equates to an average usage of 562 litres per occupied bed day in the two years since the flow control valves were introduced (or a 28.56% reduction).

Following the installation of the flow control valves, BECC reduced its usage from 804 litres per occupied bed day in 03/04 to 659 litres per occupied bed day in 04/05 to 592 litres per occupied bed day in 05/06. This equates to an average usage of 846,000 litres per day in the two years since the flow control valves were introduced (or a 22.2% reduction).



Graph 4 – Water savings per Occupied Bed Day - Bundoora Extended Care Centre



Graph 5 – Water savings per Patient Treated - Panch Health Service

Following the installation of the flow control valves, PHS has reduced its usage from 129 litres per patient treated in 03/04 to 90 litres per patient treated in 04/05 to 73 litres per patient treated in 05/06. This equates to an average usage of 98 litres per patient treated in the two years since the flow control valves were introduced (or a 36.93% reduction).

Overall, Northern Health has achieved an average 23.86% reduction in water usage across all four campuses. Between July 2004 and June 2006 Northern Health saved the following litres of water:

BECC 5,752,314 litres

PHS 2,865,755 litres

TNH 34,843,380 litres

BHS 12,989,593 litres

Total number of litres saved per annum through this project was 56,451,042 litres.

These outcomes have been sustainable despite the increase in the number of patients treated across the health service. The reduction in flow rates of vanity basins has also reduced the splashing and user wetting around these areas.

No complaints have been received from patients or staff in relation to a reduction in water pressure/flow. There has been no impact on daily operating functions at any of the facilities and there was no down time of services during the installation of the flow control valves.

Water Management Plan

As one of the top 200 users of water in metropolitan Melbourne, The Northern Hospital worked with the Victorian Department of Human Services, the three water retailers and two other Melbourne metropolitan hospitals to develop a water management plan template for the whole of the Victorian healthcare sector. Of the three hospitals in the pilot program, The Northern Hospital was the first one to complete its plan. This plan is now available on the DHS website for all other hospitals to use as a template.

Retrofit of Sterilisers

As a result of the water efficiency audit, Northern Health identified that other than sinks, taps and showers, its next biggest user of water was its Central Sterilising Store Department (CSSD). CSSD was estimated to be using approximately 1,357,000 litres of water per day at The Northern Hospital alone.

Investigations were undertaken to determine if this usage could be reduced. After some research it was determined that most of the water used for the sterilising process could be recycled through the hospital's chilled water supply. A retrofit of the sterilisers was completed early to mid 2007. This retrofit will ensure the water consumed per cycle drops from 350 litres to just 50 litres per cycle. This initiative is estimated to save approximately another 3.5 million litres of water per annum across Northern Health.

Craigieburn Health Service Initiatives

Following on from its success in reducing water consumption, Northern Health now has a policy in place that all new building projects and refurbishments are automatically fitted with flow control valves to ensure this initiative remains sustainable and we continue to contribute towards ensuring this scarce resource is conserved. As a result of this policy, flow control valves were automatically built into the design of Northern Health's newest facility, Craigieburn Health Service.

The team responsible for the design of CHS took the challenge to reduce water consumption even further. The following are further water saving initiatives built into the design:

- solar assisted water heating
- AAA rated water efficient taps and AAAA rated water efficient toilets
- reuse of rainwater and clean waste water from the dialysis treatment plant for toilet flushing in the building and for irrigation of the landscape
- bioswales to control and clean rainwater run off the car park areas

Estimated savings from this design are expected to be a 50% reduction in the amount of water used when compared to business as usual.

Conclusion

Northern Health is recognised as a leader in the field of water saving initiatives. In recognition of its efforts in reducing water consumption, Northern Health has been awarded the following awards:

- in 2005 The Northern Hospital was awarded a Pathways to Sustainability award from Yarra Valley Water in recognition of contribution to the delivery of water management plans.
- Northern Health was awarded the SaveWater!® Award in 2005, under the Government Division.
- The Northern Hospital was one of two finalists in The Premier's Business Sustainability Awards 2005 in the public sector category. These awards recognise and reward those organisations leading the way in environmental sustainability.
- in June 2006, Northern Health was chosen as the winner of the United Nations Association of Australia Excellence in Water Management Award.

As demonstrated by Northern Health, the concepts of this project can be implemented at a wide range of healthcare facilities. Northern Health has a range of facilities including nursing homes, sub acute and acute facilities. The concept has been successfully implemented at all of these sites and can be just as easily implemented at any other healthcare facility.

For further information please contact:

Sharon McNulty

Director

Facilities Management

Northern Health

(03) 8405 8383

Email: sharon.mcnulty@nh.org.au