

# Water management for healthcare

**Bruce Smith**, B.E., M.I.E. Aust CP Eng.

Manager, Hydraulic and Water Saving — Department of Public Works and Services NSW

## 1.0 Developments in water conservation

There have been a number of developments over the past few years which have brought home to the community the value of water and the need to conserve and to use it more wisely.

These developments include:

- Droughts throughout Australia which have severely depleted the water supply of many town and cities. It has led to the introductions of water restrictions and has brought home to us all the scarcity of this valuable resource and hence the need for water conservation and recycling to maximise the benefits from available supplies.
- Change in community attitude towards a more environmentally sustainable use and reuse of resources.
- Governments are seeking to halt and where possible reverse the natural resource degradation.
- Those managing water supplies are coming under more pressure to reduce draw off from rivers and to increase environmental flows.
- Change in pricing policy by Water Authorities away from rate and fixture based charges with free water usage allowances, to usage based charges which more accurately represent the true cost of supply of water supply and the treatment and disposal of wastewater.
- Development of a range of more water efficient fixtures to help minimise usage and conserve water
- Development of water conservation practices both in design of facilities and in their operation
- Education of public to value this resource and not to pollute it.
- Governments have set up services to assist major water users, eg DPWS seeks to encourage all NSW Government projects to be water wise, ie to incorporate efficient use of water in every aspect of a project and to facilitate the incorporation of innovative solutions and technology for more efficient water usage and cost effective recycling of wastewater.

## 2.0 Problems in healthcare facilities

When most healthcare facilities were built little consideration was given to the conservation or wise use of water. There is now a need to ensure that all future facilities do so and to go back and to consider how water is being used, and the steps that can be taken to use water more efficiently and to set in place procedures to effectively ensure a sustainable use in the future.

Before considering ways to improve water efficiency in healthcare facilities, it is helpful to consider some of the problems that now exist.

## Problems with water usage in healthcare include:

- Inefficient water usage exists in many healthcare facilities – wastage of valuable resource and money.
- Acceptance of past practices where water was seen as a dispensable commodity.
- Many of the water supply systems are very old and have numerous leaks.
- Ad hoc development of the water supply systems as new buildings are added.
- Development of many healthcare facilities before water efficient fixtures were available.
- Inadequate plans of water supply system being kept / no overall water supply plan.
- No asset management for water system, to plan replacement - pipes, valves, fixtures.
- Lack of monitoring of water usage both on the macro and micro scale. No benchmarking at a state or regional level, or within a hospital facility level (eg boiler water usage, water usage through cooling towers, bleed off rates, water used for cleaning, pool make up, water usage for hot water, irrigation of gardens and lawns).
- Information provided by Water Authorities not being used.
- No consideration being given to use of lower class of water. Alternative sources- lower grade eg groundwater, once through cooling processes.
- Lack of sub-meters and monitoring eg laundries, kitchens, cooling towers etc.
- Lack of maintenance of systems - tank overflowing, cisterns leaking, valves unable to be closed, bleed off rate not set properly.
- This all leads to low priority being given to this matter by executives and a lack of funds to do anything about it.
- Water and sewerage charges are increasing. eg Sydney, Perth, Newcastle.
- Multiple charges - both service and usage charges for water and sewerage; cost increasing.

## 3.0 Water efficiency strategies

### Strategies to solve the problem of inefficient water usage in healthcare facilities include:

- Promotion of water conservation and recycling strategies and where possible incorporate these into projects.
- Adoption of a total water cycle management approach. All water entering or leaving the site be considered
- Giving preferences to products that have been shown through life cycle analysis, to have lower impacts on the water environment.

- Knowledge of the amount water currently being used.
- Benchmarking to determine efficiency. A water efficient hospital should have a benchmark of between 0.5 and 0.7 kl / bed / day. (Laundry done off site)
- Adoption of specific targets for reduction - in NSW a target of 30 % has been adopted for all government facilities. The Minister for Land and Water Conservation has set out new responsibilities of government agencies in regard to water conservation. The Chief Executive Officers of NSW government agencies need to: demonstrate that their organisation is using water efficiently; carry out comparison of usage (say per employer or per pupil), for premises and facilities and report in the agency's annual report and; increase awareness of water conservation and promote responsible use.
- From the work carried out to date, a 30 % reduction can be achieved through increased water efficiency and without the reuse of water.
- Monitoring of water usage and undertaking of water audits and leakage detection programs.
- Installation of water conserving plumbing devices and signage
- Programming to replace inefficient water fixtures.
- Use of products and processes that require little or no water.
- Adoption best practice strategies.
- Examination of accounts from water authorities.
- Overcoming the 'nothing can be done' syndrome.
- Overcoming inadequate planning of the past by seeking assistance.
- Updating of water maintenance records.
- Setting in place procedures to up date plans.
- Monitoring of base flow and usage. 'We believe that what you can monitor you can improve.' - Optus advertisement.
- Empowerment of people to be able to do their work.
- Nomination of a water manager and training of staff.
- Development of staff and patient water awareness programs.

#### 4.0 Water audits

The State Projects Division of the DPWS has carried out water audits on nine hospitals: in NSW at Sydney, Camperdown, Royal South Sydney, Prince of Wales, Prince Henry and Sutherland hospitals; interstate in Western Australia at King Edward Memorial and Princess Margaret hospitals and internationally in Bahrain at the Defence Force Hospital.

#### 4.1 Water audits of hospitals

**The basic aim of the audit is to determine:**

- Amount of water being used by the hospital
- Areas of usage

- Amount of usage in each area
- If there is any leakage or wastage in the system
- Efficiency of fixtures and processes using water
- Whether water usage can be reduced and if so how, and at what cost
- Savings that could be achieved
- How to operate the system at optimum efficiency
- Such an audit has to be undertaken in a systematic manner

#### 4.2 Key tasks

- Gathering of historical data on water supply system and usage at the hospitals, and analysis of trends.
- Interviews with relevant stakeholders - hospital maintenance staff and users.
- Site assessments of water usage in each building and surrounding environ.
- Water flow monitoring and recording.
- Data collation between site assessment and monitoring.
- Audit and review.
- Analysis and interpretation.
- Leakage assessment.
- Strategy and solution development to improve water efficiency.
- Water and cost saving options
- Implementation costs and payback
- Report outlining findings of audit together with recommendation.

#### 5.0 Summary

In summary there are three main ways of reducing water consumption at your healthcare facility:

1. Improved water management - develop a water management program. Such a program would include a number of stages: water audits, benchmarking, implementation and monitoring.
2. Improved environment which requires less water.
3. Improved water awareness and usage by staff and patients.

#### References

- Water Conservation in Buildings and Surrounding Environs. Bruce Smith 1994
- Water Conservation and Recycling Background Information and Guidelines. NSW Department of Public Works and Services Report No. 96129 August 1997.
- Water Conservation through Good Design. Western Australian Water Resources Council Nov 1986.