

Sustainable Water Challenge Project Entry 2005

Council: Newcastle City Council

Project Title: Water Harvest

Project Category: Retrofit

Project Summary:

The Harbour Foreshore is Newcastle's most popular recreation area and is maintained by Newcastle City Council. Previously, 50 megalitres of town water per year was used to irrigate the grassed area within the park. However, recently, the Water Harvest Project, which is managed by Newcastle City Council's Green Energy & Water Team, has been implementing water-saving changes within the park. This has been achieved by accessing bore water through 13 spear points located in three set areas to supplement the town water. Stages 1 and 2 of the Water Harvest Project are currently saving 20 megalitres of water per annum and there is the potential to save 50 megalitres once further stages are completed.

Project Objectives:

The objectives of the Water Harvest Project are to:

- Develop and implement innovative water-saving irrigation technologies
- Reduce water use by Council
- Reduce pressures on potable water supply
- Demonstrate sustainable water use practices to the public

Project Outcomes:

Environmental:

The Water Harvest Project will reduce pressures on the town water supply by supplementing the use of potable water with ground water. In addition, the development of 'smart technologies', linking all sites in the Water Harvest Project, will monitor environmental conditions (wind, soil conditions etc), allowing ideal site-specific irrigation patterns to be implemented. Sensors will be installed in the ground to measure the moisture content of the soil. This information will then be relayed to a central computer which monitors when and how much water should be used for irrigation at any given time.

For an initial investment of \$170,000, the Water Harvest Project will pay for itself in less than 5 years and will continue to reduce Council's town water consumption by up to 15% annually.

Reductions in water use achieved as a result of the Water Harvest Project will be reported on Climatecam, an on-line tool currently in use by Newcastle City Council. As part of Climatecam, Newcastle's monthly consumption data is collected and involves monitoring energy, water, waste and landfill gas

production as well as a count of registered motor vehicles and is available on www.climatecam.com.

Technical:

A number of Water Sensitive Urban Design features were implemented as part of the Water Harvest Project. Through the installation of a number of tanks, used to store harvested water, the amount of water transported between catchments is reduced. In future, the tanks will also act as temporary on-site storage measures, which help to reduce runoff peak flows. The demand for potable water is reduced as a result of the use of harvested water for irrigation. There are also future plans to use the tanks for capture and storage of rainwater.

Other technical aspects of the project include:

- Allowing in pump size for expansion of the system
- Recognising the need for testing of flow rate from spears for an extended time to accurately gauge the number of spears necessary to meet the demand for water

Technical support was sought from:

- Rod Elphick Electrical for control of levels (flow rates etc)
- Hunter Farm and Irrigation (Phil Chegwitten) for the hydraulics of the system (flow rates, pipe sizing, ongoing technical support)
- Advitech for concept design process

Transferable:

A number of valuable lessons have been learnt during the development of the Water Harvest Project.

In order to justify supplementing potable water with ground water, it was necessary to provide data that demonstrated the benefits of this option. As such, we learnt the value of measuring the problem and developing back data in order to manage the problem effectively.

It was also necessary to ensure appropriate ground water monitoring was implemented to ensure that ground water tables were properly managed as a mandatory requirement of the Department of Infrastructure, Planning and Natural Resources.

Variable speed drive pumps, which were used for better pressure control within the system were also a valuable tool employed during the Water Harvest Project.

Difficulties Encountered:

A number of technical difficulties have been encountered during the Water Harvest Project. For example, as a result of introducing harvested water into the irrigation system, increased water pressure was created, which existing infrastructure was unable to deal with. This was due to inadequate maintenance. However, since the project has been running, a more proactive system of maintenance has been introduced, which has been beneficial, for not only the Water Harvest Project, but for the whole of facilities management. Another

problem that was experienced was the variation in groundwater flows, which led to inadequate water supply at certain times.

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