

WATER PROOFING PORT AUGUSTA'S PARKLANDS

RIECK SHINE

INTRODUCTION

The reality of severe water restrictions is now evident to all Australians. In South Australia, we are constantly reminded of this by the media and I would suggest the message is starting to be effective, especially when we ask a 7-year-old about this important issue.

While I consider the messages effective, we need to realise that valuing and preserving water is going to be part of our ethical environmental standards, something that we accept as part of the Australian lifestyle.

This in mind, we are still a long way off securing sustainable water use from the River Murray and this is of major concern.

Port Augusta, along with its neighbouring cities of Port Pirie and Whyalla, is heavily reliant on water from the River Murray for both human and industrial consumption. Given the River Murray's poor state of health, with obvious and increasing salinity levels and low water flows, I believe the cries of 'we need to act' are now being heard by many people.

In addition to this we need to consider the current predictions of experts - that in the near future our region will experience increased pressures on infrastructure, environment and services as a result of a large population increase due to various economic opportunities such as the mining boom in the north of the State. One would expect as a result of this alone, we would be doubling our water use.

Focussing more locally on Port Augusta, it is estimated the city will almost double in population in coming years. To address the future water needs, while considering the National Water Initiative which is aimed at reducing flows from the River Murray, Port Augusta is taking the initiative and preparing for a future which is not totally reliant on the River Murray (mains) water.

Port Augusta is a strong advocate for considering alternative water sources and, if feasible and sustainable, channelling resources into implementing these better and more effective practices.

DO COUNCILS HAVE TO BE SOLELY RELIANT ON THE RIVER MURRAY?

I believe not and am thankful that I work for an innovative Council who supports continuous review and implementation of best practice in sustainable water management principles.

Port Augusta City Council has tasked me with the role of developing a plan through research, analysis and consultation to 'waterproof the City's parklands' that will be exclusive of utilising water from the River Murray.

I am working with consultants on a 'Water Resource Management Study' of the City, aimed at alternative infrastructure and practices to address the National Water Initiative and reduce reliance on mains water. The study is considering a number of focus areas (including but not limited to):

- Stormwater runoff
- Reclaimed effluent water
- Underground aquifer storage and recovery (ASR) and
- The creation of wetlands.

This will all be considered in view of the City's demands, through the innovative approach of utilising a computer software model (WaterCrest) to determine accurate measures and statistics.

It is anticipated that a draft version of the Water Resources Management Study will be presented to the Port Augusta City Council for consideration in December 2007.

It is important to note however, that people should be mindful of the ever changing demands, therefore the Study should be considered as a 'living reference document', something that can be further developed to accommodate the changing needs of Port Augusta.

An example of 'changing demands' are the new proposed city developments to accommodate 1000 new land/housing allotments, expected to accommodate up to an additional 3000 new residents. These developments can be considered by inputting data and information into the WaterCrest model which will then clearly identify the most cost effective and efficient model/framework to achieve optimum use of all water resources in the area.

WHY MAKE THE CHANGE?

Port Augusta is located in a very arid area of Australia. It is commonly known as the driest City, in the driest State, in the driest inhabited continent of the world.

More than a decade ago Port Augusta City Council realised it needed to address what has now become the National Water Initiative and reduce the City's reliance on water from the River Murray.

A logical answer in achieving this goal was to explore opportunities surrounding reclaiming waste effluent water that flowed out into the local marine environment of Spencer Gulf, 5 to 7 million litres a week, depending on residential use.

For this to become a reality, two staff members travelled overseas on a study tour to Mexico, Israel and Spain to consider best practices associated with:

- Water sustainability, usage
- Water management frameworks
- Waste water reuse operations
- Open space water wise garden techniques
- Irrigation central control systems
- Subsurface drip irrigation installation and use

These locations were chosen due to their environmental and climate similarities to that of Port Augusta.

Amongst the information collected and observed, one of the concepts that was considered to be very innovative and effective surrounded governing legislation that was implemented to support better management of water resources.

For example, some of the principles of the Legislation included:

- Only allowing 5 square metres of developed parkland/open space per head of population in a developed area. Of this area, only 3 square metres could be watered (soft landscape eg, lawns, trees, gardens), and the other 2 square metres had to consist of hard landscaping (eg, paths, rock mulch, sculptures, signage)
- Water, wherever possible, had to be reclaimed with 5% of this being reallocated for parkland use and the other 95% allocated to food crops or human consumption
- Only subsurface drip irrigation was permitted for installation in new parkland developments, with a replacement strategy for older irrigation upgrades
- City parklands were categorized from high to low profiles and this was based on location and use. Water allocation was distributed considering all of these factors
- Governing water restrictions were implemented, with a fines framework attached
- Reclaimed water was stored in underground aquifers to save evaporation. This was later metered out to customers.

Port Augusta City Council considered a number of these concepts and had the foresight to align to and implement a number of these practices. The Council is proactive in continuing along this path and now, as many of these principles are appearing to be considered throughout Australia, is considered a leader by some in this area.

Port Augusta City Council is developing its own sustainable water supply and in 2004, with financial support from the State Government and SA Water, one of our concepts became a reality.

The project involved the installation of a 500kl per day Waste Water Treatment Plant (sewer mining harvesting scheme), coupled to an Irrigation Central Control system. The project enables us to water a large percentage of the City's parklands with treated waste water through a subsurface drip irrigation system. This project was based on the initiatives implemented overseas and observed on the study tours.

The concept of the project includes the sewer mining scheme, harvesting untreated sewage water from an SA Water sewage pump station and treating it at the Waste Water Treatment Plant. This water is used to service 60% of the City's irrigated parklands. The aim is to reach 95% by 2010.

This may sound like a simple project however it is very complex due to required regulatory processes and practices that are required to accommodate legislation and authority issues attached to the Department of Health, the Environmental Protection Authority and SA Water.

In addition, consideration needs to be given to seasonal requirements. For example, in winter, the Waste Water Treatment Plant produces more than enough water to meet requirements, however in peak periods (i.e. over the summer months), supplementary mains water is required to meet demands.

To support the management of this resource Council has developed management plans and undertaken numerous risk assessments which consider, but are not limited to, the following:

- Processes and practices
- Annual 2.8 metre evaporation rate
- Vegetation transpiration rates
- Differences between overhead and subsurface watering systems
- Soil types
- Turf and plant selection
- Wind and precipitation rates

These, combined with our irrigation central control unit, weather station and moisture monitors, enable us to make a savings of around 30% of water use, which has large economic savings.

We have a specialist team in managing the project and its future development. All members are considered pivotal to its success.

The team includes (but is not limited to):

- **Greene Eden Watering Systems** - irrigation central control system, sub-surface irrigation, water management specialist
- **T-link** - turf, fertiliser, soil management specialist
- **Aquatek Irrigation Pty Ltd** - irrigation management plan, development and annual reviews
- **Australian Water Environments** – hydrology, aquifer storage and recovery specialist
- **Wayne Phillips and Associates** – consultant to the water industry
- **Footner Plumbing** - waste water treatment plant and reticulation pipeline installers/technicians, trouble shooters, maintenance personal
- **SAGE Automation** - prologic control unit specialist
- **Hydromet** – monitoring equipment specialist
- **Power Pumps** – pumps, monitors and hydraulic specialist
- **Carlton Electrics** – waste water treatment plant and field electrics
- **SA Water** - effluent water supplier, technical information support
- **Department of Heath** – standards, quality assurance, monitoring authority, technical information support
- **Environment Protection Authority** – standards, quality assurance, monitoring authority, technical information support
- **NATA** – quality assurance, water testing
- **Port Augusta City Council's IT Department** - all computer and communication equipment
- **Port Augusta City Council's Parks and Garden Staff** – irrigation central control, parkland irrigation, waste water treatment plant operations
- **Eimco Water Technologies Pty Ltd** – waste water treatment plant manufacturer, technical information provider

GOVERNMENT FUNDING

Both State and Federal Governments have contributed greatly to this project.

The State Government provided significant funds for the Waste Water Treatment Plant and the Federal Government provided funding through the Community Water Grants initiatives for some on-ground works. This funding has contributed to the overall vision of Council and helped fund subsurface irrigation installation, and an upgrade of the irrigation central control unit from a 2 wire path to a hybrid system that now has radio controlled units out in the field.

The funding has also further supported community education initiatives with support of the local Rotary Club and a set of display gardens at the Australian Arid Lands Botanic Garden in Port Augusta, aimed at better educating the broader community with best practice in water wise gardening.

It is hoped both the Federal and State Governments will continue to support this project as we are now being recognised for our progressive approach.

WHAT OTHER OPTIONS ARE CURRENTLY BEING INVESTIGATED?

The aim of Council is to use reclaimed storm water in addition to the water created by the Waste Water Treatment Plant.

Test drilling to locate underground aquifers commenced in May 07 with a focus on underground stormwater storage. It is envisaged the water would be reused during peak periods (i.e. summer), resulting in Council becoming more sustainable and self sufficient.

The concept surrounds stormwater outlets being diverted to engineered wetlands for water treatment before being pumped into underground aquifers and stored for later use.

Another option includes further reducing the amount of treated wastewater discharged into the Spencer Gulf by exploring the possibility of reusing water from SA Water's sewage treatment ponds.

In addition, Port Augusta City Council is keen to see a project by Acquasol established on the City's outskirts. This would focus on an environmentally friendly, solar powered, desalination plant which would supply water to the City.

IN SUMMARY

Fortunately more than a decade ago Port Augusta City Council recognised a need to allocate resources for exploration of more self-sufficient and sustainable water practices.

While significant progress has been made with the use of treated sewage water, Council recognises there is still a long way to go.

We consider the collection, treatment and storage of stormwater to be a major factor and goal in supporting sustainability and reducing the on-going high cost of water to Council, which ultimately impacts on rate payers.

The present state of the River Murray has further highlighted the need for all councils in South Australia, and indeed around the nation, to be innovative and provide their communities with a sustainable water resource and Port Augusta City Council would welcome any input to support this vision.

To accommodate the health and wellbeing of Port Augusta residents, Council has established many parks and gardens and 'green' recreational facilities/areas within the City, this has also added to the 'green and aesthetic' value of the City's appearance.

The success of the transformation of the Port Augusta East and West Foreshores is living evidence of this value. The area was developed from an arid, dusty landscape, to a green and attractive one, which has had a significant and positive impact in various social, economic and environmental factors.

To maintain the status quo, there is also a need for people to understand the high costs associated with sustainability in these areas, let alone creating more. If water continues to be available and sourced from the River Murray, the unavoidable rise in the cost of water will have a huge impact on future developmental opportunities.

The answer to this is in planning and recognising the need for sacrifice in areas of minimal impact. In addition, there is a need for consistent views and a long term commitment to environmentally focussed areas.

I feel Port Augusta and Australia are getting there, but it is a challenging and costly commitment.