

## Project name

Angus Creek Stormwater Harvesting and Reuse Scheme (the Scheme).

## Location

Blacktown International Sportspark Sydney (the Sportspark), Rooty Hill, NSW.

## Overview

The Sportspark is an elite international sporting facility. It has hosted over 5,000 events and attracts over 750,000 visitors a year. The Sportspark requires large volumes of water for irrigation, and we recognised the need to improve the drought resilience of its facilities.

Angus Creek is a tributary of Eastern Creek. The Angus Creek catchment is 655 hectares and generates about 2 billion litres of stormwater a year, which runs off the suburbs of Rooty Hill and Minchinbury and into Angus Creek.

The Scheme diverts peak flows from Angus Creek and collects stormwater generated from hard surfaces such as the Sportspark stadium roof and surrounding carparks. Harvested stormwater is then used to irrigate the Sportspark and neighbouring Anne Aquilina, Kareela and Charlie Bali reserves. It is also used to top up the Nurragingy ornamental lakes.

Community consultation (via online and face-to-face forums) showed overwhelming support for a stormwater harvesting and reuse system. Community participants indicated that the Scheme made economic sense, was a good use of resources, was a great way to save water, and improve the condition of local waterways.

## Key outcomes

The Scheme was successful. It:

- treats and collects over 200 million litres of stormwater a year from Angus Creek (10% of the average total flow) and nearby hard surfaces which is used to irrigate the Sportspark and surrounding reserves.
- provides alternative water supply and storage during drought conditions, reducing the reliance on potable water
- improves creek conditions by harvesting only storm flows (thus modifying creek flow to resemble natural hydrography). Harvesting reduces the pollutant load and creek erosion along Angus Creek and further downstream into Eastern Creek.
- is carbon neutral – all electricity used by the Scheme is offset with renewable energy generated via solar panels.
- provides long-term financial savings to Blacktown City Council. The cost of harvested stormwater is about 20% cheaper than the cost of potable water supplied by Sydney Water.

## Timeframe

- 2013 to 2015 - the Scheme was construction.
- 2016 - the Scheme's commissioning phase began. This involved extensive monitoring to ensure water from the Scheme was 'fit for purpose', i.e. suitable for sportsground irrigation.
- 2017 - the Scheme became fully operational.

## Funding and costs

Funding was received from the Australian Government (Department of the Environment), the NSW Government (EPA) and Blacktown City Council, with support provided by Water NSW (extraction licensing permission).

<b>Funding received</b>	
Australian Government National Urban Water and Desalination Plan: Stormwater Harvesting and Reuse Grant	\$2,212,500
NSW Government via the Waste & Sustainability Improvement Program (WASIP) Fund	\$ 286,000
Blacktown City's Environmental Stormwater Management Program (ESMP)	\$3,737,860
<b>TOTAL</b>	<b>\$6,236,360</b>
<b>Breakdown of costs (rounded figures)</b>	
Aquifer investigations	\$ 700,000
Overall design and modelling	\$ 400,000
Mechanical components including filters, pumps and communications	\$ 500,000
Supply and installation of a 40KW solar panel system	\$ 60,000
Civil construction (includes offtake dam, ponds, wetlands, storage tanks and distribution lines)	\$4,000,000
Floating wetland rafts - supply, install and maintenance	\$ 160,000
Plants provided by Council nursery	\$ 100,000
Wetland/pond planting and maintenance	\$ 175,000
Online water quality monitoring device	\$ 25,000
Water quality monitoring + commissioning consultant	\$ 90,000
<b>TOTAL</b>	<b>\$6,210,000</b>

## Components of the Scheme

There are 4 main components of the Scheme:

1. Off-take dam
2. Three storage ponds with floating wetlands
3. Treatment wetland and treatment pump station
4. Storage tanks.

A Supervisory Control and Data Acquisition (SCADA) computer system is located in the treatment pump station. It gathers and analyses real-time data from the 4 main components of the Scheme. A smaller pump station near the off-take dam is also linked to the main SCADA system. This pump station has a turbidity and electric conductivity meter that measures the quality of the water being harvested. If the water quality fails to meet the correct standard, the pumps are switched off preventing the system from harvesting unsatisfactory water. These systems collect data on the volume of water produced, amount of electricity used and any faults. Extensive macro-invertebrate analysis and water quality monitoring is also done to provide data for long-term management actions.

## Lessons learnt

- Blacktown City Council's Steering Committee provided leadership and guidance, and was a useful vehicle for communicating project progress to all relevant stakeholders.
- During the wetland establishment phase, predation of the plants by the large water bird population was a major concern. To address this, we increased the water levels, making it harder for the water birds to reach the bottom of the wetland and remove the plants.
- The use of floating wetlands greatly reduced the likelihood of algal blooms occurring in the storage ponds during hot summers.
- There were many challenges in acquiring approvals to extract water and construct creek works that divert water from the creek into the off-take dam. The NSW Office of Water provided an exemption to Blacktown City Council from purchasing the 200 water unit shares initially required. The need to purchase water unit shares could potentially make any creek stormwater harvesting and reuse project financially unviable.
- The original design included using harvested stormwater for toilet flushing, however, the cost of treating water to this standard for a relatively small demand was not feasible.

## Further information

Blacktown City Council, Craig Bush, Catchment Projects Officer, Waterways - Phone: 02 9839 6000.