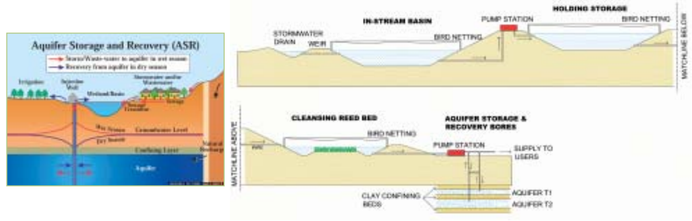
Stormwater Harvesting and Utilisation
in the City of Salisbury

City of Salisbury



Schematic section of the Parafield Stormwater Harvesting Facility

Snapshot of Parafield Stormwater Harvesting Facility

Catchment	1600 hectares
Cost	Aus $3.7 million
Land Area	11.2 hectares
ASR Bores	2
Depth	160 to 180 m
Yield	1.1 Mm3/year
Detention time	10 days
Flood Protection	1 in 10 years
Online Monitoring	pH, TDS, SS
Injection Rate	35 L/s
Supply Water Salinity	150 to 250 mg/L

The City of Salisbury's investment in a unique and diverse series of wetlands has significantly enhanced the amenity and environment, and contributed to the social well being of the community.

Projects such as the Parafield Stormwater Harvesting Facility are a great way to deliver handsomely on the triple bottom line of sustainable environment, economy and community.

These projects will help to catalyse a paradigm shift among regulators, industry and community in recognising the enormous potential of stormwater as a valuable and sustainable resource.

Importantly, they serve as a blueprint in urban stormwater management for other communities.

The City of Salisbury, in the northern suburbs of Adelaide, is a Council area of 161 square kilometres extending from the Para Escarpment and foothills of the Mt Lofty Ranges to the shores of Gulf St Vincent.

Over the past 150 years, Salisbury has evolved from a pioneering farming community into a thriving residential area with precincts for retail and commercial business, industry, technology enterprise, recreational activity and environmental endeavours.

Salisbury has gained international recognition for the way it harvests urban run-off and purifies the polluted water in wetlands, using it for irrigation and industrial use, or storing it in underground aquifers for later use in a process known as aquifer storage and recovery, or ASR.

It is achieving outstanding success in turning urban stormwater from a nuisance – and sometimes a threat – into a resource, while at the same time halting the flow of pollution into the sea.

Above: The Paddocks wetlands, a 46 hectare rich and diverse ecosystem created from derelict, salt-scalded and flood-prone land.

City of Salisbury

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'The City of Salisbury is committed to sustainable development that will meet the needs of present generations without compromising the ability of future generations to meet their needs. Importantly, it is achieving this in a manner that will preserve and enhance the natural environment through strategies that embrace people and eco-systems'

Kaurna Park wetlands, playing an important role in the economic recycling of stormwater. The beneficiaries include Holden, Edinburgh Parks, the Royal Australian Air Force (RAAF) and the Defence Science & Technology Organisation (DSTO) Edinburgh

Greenfields Wetlands, a home for more than 150 bird species, developed from 42 hectares of low-lying, saline land with a focus on environmental education and ecotourism

Mawson Lakes, a fine example of water sensitive urban design, where treated stormwater and waste water is used for the creation of picturesque lakes and for irrigation of residential gardens and open spaces

Barker Inlet, an extremely valuable but fragile ecosystem. The largest fish breeding nursery in South Australia and its rehabilitation is the key focus of the City of Salisbury

Left: A completed reedbed pond with birdproof netting. Above: Supplying 1100 million litres per year of treated stormwater to G.H. Michell & Sons, Australia's largest wool processing company

Parafield Airport, one of Australia's busiest general aviation airports

Site of the stormwater harvesting facility on airport land adjacent to the Parafield drain

Major earthworks in progress to create one of the holding basins

Constructing seven 1,050 mm diameter culverts to an instream basin

Major earth moving equipment excavating the site on Parafield Airport

Planting the reedbed with species propagated at the City of Salisbury nursery

Protecting a precious, yet fragile ecosystem

In the mid-nineties, the City of Salisbury defined a vision that it would seek to eliminate the flow of polluted water into the marine environment of the Barker Inlet of Gulf St. Vincent. The Barker Inlet is a delicate marine environment of mangroves and seagrass meadows serving as a nursery for a majority of the State's fishing industry. However, years of neglect and polluted inflows have reduced the Barker Inlet to a delicate state.

The creation of wetlands to cleanse stormwater was Salisbury's key strategy to help the ecological rehabilitation of the Barker Inlet while providing cheaper water to local industry and other users.

Stormwater is treated and harnessed in a series of more than 30 wetlands along urban stormwater paths to slow the flow and allow pollution to settle out. The wetlands cover an area of 260 hectares enhancing the landscape and creating habitat diversity.

All the wetland plants are propagated at the Council's nursery and they play an important role in the treatment of polluted stormwater. The nursery has developed a high level of expertise in propagating various wetland species, and it sells wetland plants to users all around Australia.

The Parafield Stormwater Harvesting Facility is the latest project to "come on stream" for the benefits of local industry, the community and the environment.

Parafield Stormwater Harvesting Facility

The Parafield Stormwater Harvesting Facility originated from a discussion in 1999 between City executives and the management of G. H. Michell & Sons, Australia's largest wool processing company.

The company's processing involves the use of 1100 million litres per year of mains water to wash the wool, which in turn produces large quantities of effluent and sludge. The costs of fresh water and sewerage disposal were high enough to force the company to consider alternative, cheaper locations elsewhere, potentially resulting in the loss of around 700 local jobs.

The Parafield stormwater project involves diversion of stormwater via a weir in the main Parafield drain to a 50 million litres capacity capture basin. From there, it is pumped to a similar capacity holding basin, from where it gravitates to a two hectare cleansing reed bed.

Nutrient and pollutant loads are typically reduced by up to 90 per cent and the treated water salinity is less than 250 mg/L. The system is designed to hold stormwater for around 10 days to ensure optimal treatment efficiency.

The current supply capacity of the scheme is 1100 million litres per year. The second stage would add other catchments and boost the supply to 2100 million litres per year.

Continuity of supply is gained through the creation of large underground storage of treated stormwater. This is achieved by the development of an Aquifer Storage and Recovery (ASR) system. Two ASR bores (depth 180 metres, T2 Aquifer) have been installed allowing supply when the system has no flow. The recharge water quality has to meet the Environment Protection Authority (EPA) requirements.

Through the project, G.H. Michell & Sons will receive water with a salinity (TDS) of 250mg/L, which is significantly lower than the salinity of water from the River Murray (> 400 mg/L).

The project will foster the growth of new and established industries, especially those with high water quality requirements. Prospective employment opportunities in the region will be subsequently increased.