

Water Proofing the West - Stage 1 *water harvesting/reuse and flood mitigation*

The Water Proofing the West — Stage 1, is the first component of a broader region wide system which will harvest, treat and store stormwater in specific locations, and then will distribute the recycled stormwater through to demand areas in parts of the western Adelaide region.

The project has five key elements with the following components:

1. **Old Port Road;** with wetlands and Aquifer Storage and Recovery (or ASR) which comprises a multi-objective stormwater scheme with water reuse, water quality improvement, environmental enhancements all whilst reducing flood risk.
2. **Riverside Golf Course and Cooke Reserve;** with wetlands and ASR components.
3. **Cheltenham wetlands;** which will provide treated stormwater for ASR's and irrigation to the site's open space and urban development via a lilac pipe supply system.
4. **A Linking & Distribution Mains;** Linking the Cheltenham, Old Port Road and Riverside/Cooke Reserve projects and a Distribution Mains to supply the recycled stormwater to parts of the council area.
5. **A River Torrens diversion system;** to divert river water to supply additional water to all the wetlands.

It is significant that the Old Port Road (as part of the Port Road Rejuvenation project and associated Stormwater Management Plan) and Cheltenham wetlands have both **water harvesting/reuse** and **flood mitigation** components. This multi-objective stormwater initiative by the City of Charles Sturt has meant funding could be sought from both **water reuse** and **flood mitigation** State and Commonwealth agencies, and this has ultimately resulted in the project being funded by all three levels of Government. The following Table presents the individual funding contributions:

CONTRIBUTION AGENCY	Total (\$ million)	Contribution (%)
Commonwealth Government	20.00	34.1%
State Government (OWS & LMC)	7.35	12.5%
AMLR NRM Board	2.00	3.4%
Charles Sturt (to Cheltenham)	4.80	8.2%
Charles Sturt (to Old Port, Cooke Reserve & Riverside Golf Club)	10.70	18.3%
City of Port Adelaide Enfield (contribution to Old Port Road)	1.35	2.3%
Cheltenham Developer	5.20	8.9%
Natural Disaster Mitigation Program	1.20	2.0%
Stormwater Management Authority	6.00	10.2%
TOTALS	58.60	100%

The Waterproofing the West - Stage 1 involves developing infrastructure to harvest, treat, store and distribute up to 2,400ML/annum (often quoted as 2400 Olympic size swimming pools) of stormwater annually, to replace current and future mains water demands. The project will be supporting long term sustainability for the groundwater resources in the region.

The majority of stormwater harvested would otherwise drain untreated to West Lakes, Port River, Barker Inlet and the Metropolitan Adelaide coast further degrading seagrass meadows and polluting Gulf St Vincent's coastal and marine assets. An additional benefit is the process of capturing the stormwater means many of the pollutants are also captured and managed rather than being discharged to Gulf St Vincent.

The key stakeholder organisations are:

- The City of Charles Sturt where the project is centred.
- The City of Port Adelaide Enfield is a party in the Old Port Road stormwater and will collaborate on further development of the stormwater reuse system.
- Office of Water Security (OWS)
- Adelaide and Mount Lofty Ranges NRM (AMLR NRM) Board
- Land Management Corporation (LMC)
- SA Water Corporation
- The Riverside Golf Club will accommodate a wetland on their golf course.
- Cheltenham Developer – St Clair Joint Venture is the developer for the St Clair site, containing the Cheltenham wetland and ASR and will use the recycled stormwater in the development.

Currently water demands are generally sourced from mains water supplies and/or from groundwater mainly from the Tertiary aquifer, T1. Current groundwater use in the area is estimated at 1,792 ML/annum. Continued long term use of the aquifers is considered unsustainable due to increasing salinity that occurs, and increasing salinity is starting to be seen at some sites. A number of users of aquifer water have commenced mixing groundwater with mains water, or converting completely to mains water to maintain turf and plant health.

Once recycled stormwater becomes available and delivered, then replacement of mains water demand is immediately realised, lessening our dependence on the River Murray water.

This project conforms to the Council's strategic planning for a Sustainable City, and the City has taken the opportunity to improve their water security through sustainable recycling of stormwater and with additional benefits of improving the environmental health of our coastal waters.

Adelaide experiences high seasonal rainfall variability, with majority of rain falling over winter. This project approach is that stormwater will mainly be harvested and treated during the winter. ASR represents a significant underground storage reservoir, enabling injection of substantial volumes of water during the winter and recovery and reuse over the summer months.

Investigations have shown the feasibility of this integrated scheme with wetlands of approximately 13ha spread across the three sites which should achieve 1300ML/annum and 1100ML/annum of recycled stormwater from the Cheltenham and Old Port Road/Riverside sites.

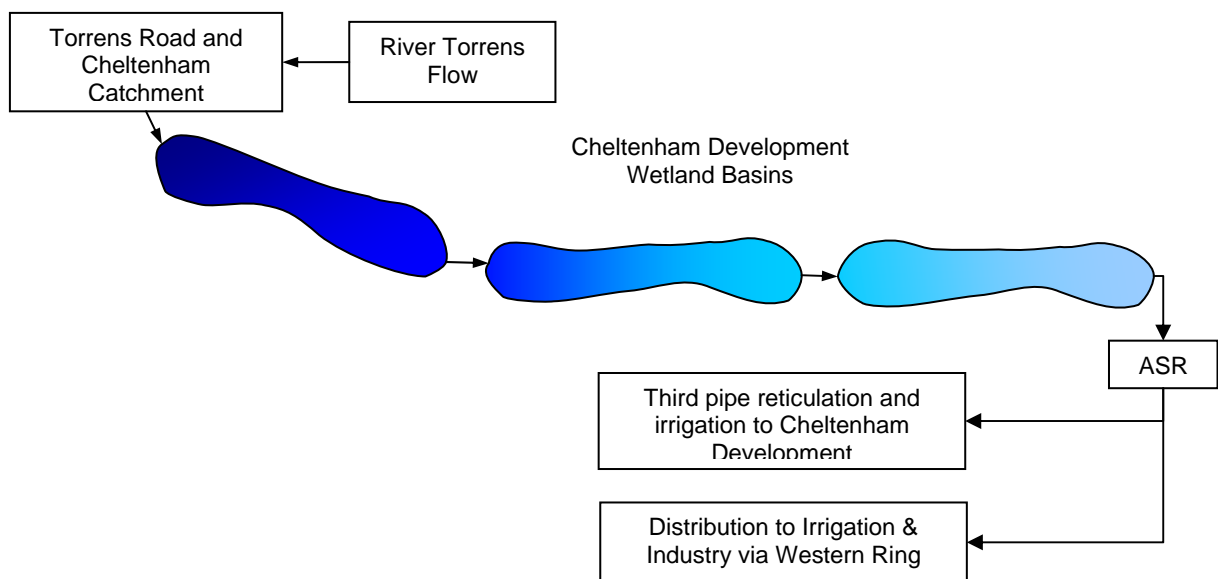
Cheltenham Redevelopment wetlands

The wetland and ASR system for Cheltenham has passed through a number of iterations as the opportunities for stormwater harvesting have been further explored. The scope of the Cheltenham project, as reflected in this proposal, comprises the following:

- Collection of on-site stormwater (49ha site, estimated volume 77ML/a)
- The up-gradient portion of the Torrens Road Catchment (420ha, 623ML/a)
- A portion the Hindmarsh-Enfield-Prospect (HEP) catchment (130ha, 123ML/a)
- A portion of the winter flow from the Torrens River (up to 600ML/a)
- Treatment through a wetland system (approximately 6ha)
- Internal site distribution to public open space and proposed residential dwellings (up to 1,200)
- Distribution infrastructure to supply demand from the immediate vicinity (additional public open space, proposed Transport Oriented Development site and adjacent industries) and the broader area through the interconnection with other stormwater harvesting facilities.

The Cheltenham project incorporates the construction of two diversion structures within the existing stormwater network (one for each catchment being diverted), a pumping station and associated pipework to connect the River Torrens to the uppermost reach of the serviced catchments and internal infrastructure within each of the proposed new streets to service customers.

A schematic diagram of the scheme is presented below.



Old Port Road, Riverside Golf Course and Cooke Reserve, combined wetlands

This wetland and ASR system combines part of the Port Road Rejuvenation Project (PRR), and wetlands at the adjacent Riverside Golf Course and Cooke Reserve. The PRR concept incorporates upgrades to a number of stormwater systems for flood mitigation and a combined wetland ASR system to harvest and treat stormwater flows along over 7km of Old Port Road, and Port Road. For the purposes of this WPW Stage 1 project, the 1.8km of wetlands in Old Port Road is constructed, which receives approximately 590ha catchment, which then has flood mitigation and water reuse project components.

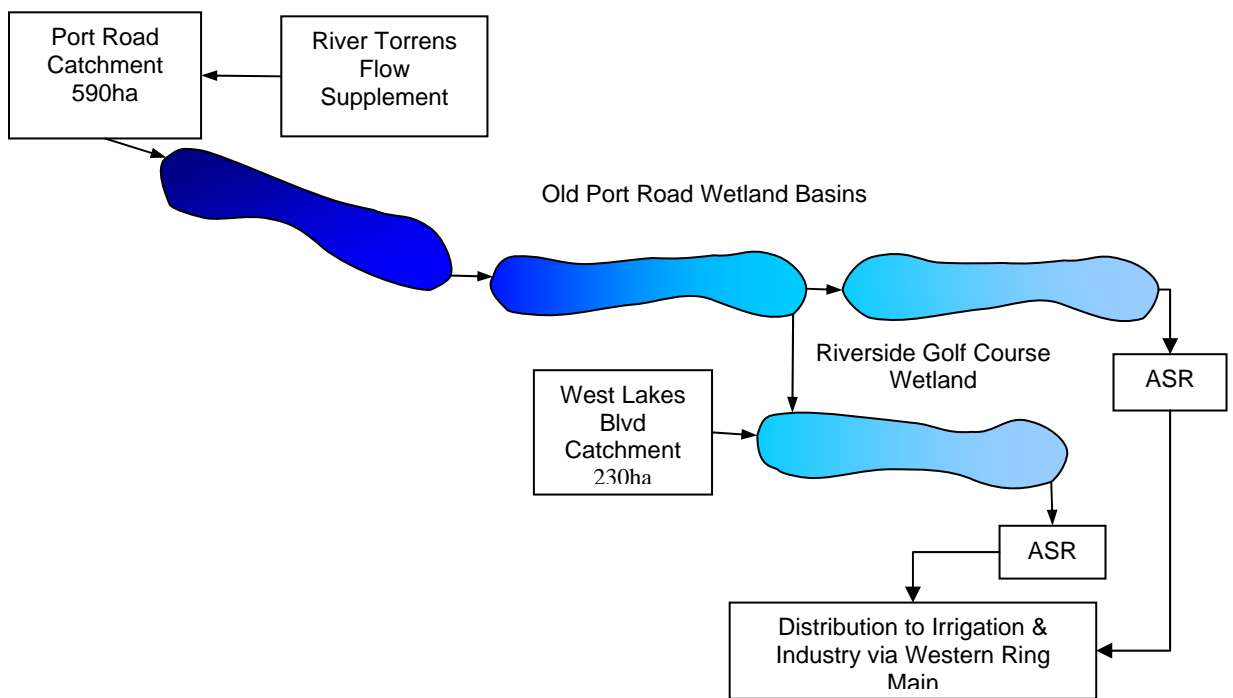
Old Port Road, Riverside Golf Course and Cooke Reserve, combined wetlands (con)

The Riverside Golf Course (RGC) is identified as a high water user, is located 1km south west of Old Port Road, and neighbouring is 8ha of irrigated Council Reserves and the former Port Adelaide wastewater pump station. Combined, these immediate water users have an estimated annual demand of over 400ML/annum. Further, the golf course offers land for additional wetland basins to optimise stormwater capture from Port Road catchment and the West Lakes Boulevard (local) catchment of 170ha. The RGC wetlands are linked with nearby Cooke Reserve to deliver water to the local users.

Stormwater from Port Road catchment is treated through the Old Port Road wetlands, and harvested for ASR downstream. Stormwater from the West Lakes Boulevard catchment is to be diverted to RGC, supplemented by partially treated stormwater recovered from the Old Port Road wetlands. Creating parallel offline wetlands at Riverside improves efficiency of the stormwater capture from Port Road catchment.

Boosting treatment potential and harvest, flows from the River Torrens are diverted into the head of the Port Road catchment when there is excess storage capacity for low flow harvest treatment.

A schematic diagram of the scheme is presented below.



EXPECTED OUTCOMES OF WATER PROOFING THE WEST – STAGE 1 PROJECT

Community Benefits

The project will provide recycled stormwater to some of the most publicly visible reserves and developments in the city. This in the future will include AAMI Stadium and the extensive open spaces and parks in the City of Charles Sturt and around West Lakes, Port Road and the new Cheltenham urban development.

The Council is committed to a program of community engagement to ensure that support for the project is maintained. A key feature of the project is the provision of recycled stormwater to prime industrial areas and a targeted program of marketing is planned. This is demonstrated by Council's commitment to 'One Planet Living'. As the project rolls out schools will be provided with recycled stormwater and an education program would be offered with the supply. The total effect of this will be to raise community awareness of the importance of catchment management, water conservation and water substitution.

It is important to note that the reuse of stormwater is gaining a high level of community interest and support in Adelaide. There is a perception that what has been achieved in the City of Salisbury (in regard to wetlands and stormwater ASR and reuse) should be replicated across Metropolitan Adelaide. The fact is that Salisbury has some unique circumstances that have allowed this to be so successful and establishing wetlands and ASR schemes in the built up areas in the central and western Adelaide suburbs has a host of challenges, including the lack of open space and the price of land. This project will provide the community with added enthusiasm for sound water management and will generate a strong community ethic that stormwater is a viable resource and that conservation measures (in both water collection and water use) should be embraced.

Like several other delivered projects involving stormwater reuse, a strong sense of community ownership and understanding in better stormwater and water sensitive urban design will be generated by this proposal. Community value of access to outdoor recreational infrastructure is a key benefit. Healthy lifestyles are promoted by open space in communities, and healthy lifestyles deliver social and economic benefits in terms of reduced health care costs, improved work productivity etc.

Environmental Benefits

While the project contributes to savings on water cost of supply it also has a significant positive environmental impact including:

- Protection of groundwater resources for other users, recharge volume plus substitution
- Creation of wetlands which provide recreation and bio-diversity advantages
- Increased irrigated areas which reduce the heat island effect
- Access to water enables watering of trees in open space preventing die off (as would happen with salinity in the water) and reduced value in this space
- Improvement of water quality due to reduced polluted stormwater discharged into the Barker Inlet and metropolitan coastline, reducing the impact on seagrass meadows.
- Overall improvement of urban amenity in areas surrounding wetlands (irrigated areas). Increased amenity value of stormwater drain improvements will occur; - the Old Port Road part of the project improves greening and vegetation where the current concrete culvert acts as a stormwater drain.