



Government of South Australia

Department of Planning,
Transport and Infrastructure

**Superseded/repealed from 1 November 2021 –
refer to**

<https://www.dit.sa.gov.au/standards/environment>

RECYCLED WATER GUIDELINE:

**SUSTAINABLE USE OF WATER FOR
INFRASTRUCTURE CONSTRUCTION, MAINTENANCE
AND IRRIGATION**



Recycled Water Guideline

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First published June 2013

This guideline was developed by the Environmental Group, Projects Directorate, Transport Services Division. It has been approved and authorised for use by departmental staff and its authorised agents by:



Director, Projects
24 June 2013

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GLOSSARY

Aerosols

Fine air borne water droplets commonly spread via irrigation.

Approval^

The provision of official permission. A recycled water approval is issued by the Department of Health and Ageing (SA) following an application and accompanying information from a proponent for recycled water use.

Aquifer Storage and Recovery (ASR)

The process of recharging water into an aquifer for the purpose of storage and subsequent withdrawal.

Blackwater*

Water containing human excrement

Consumer*

An individual or organisation that uses drinking water.

Disinfection*

The process designed to kill most microorganisms in water, including all pathogenic bacteria. There are several ways to disinfect, with chlorine being most frequently used in water treatment.

Greywater*

Wastewater from the hand basin, shower, bath, spa bath, washing machine, laundry tub, kitchen sink and dishwasher. Water from the kitchen is generally too high in grease and oil to be reused successfully without significant treatment.

Hazard*

A biological, chemical, physical or radiological agent that has the potential to cause harm.

Industrial wastewater*

Wastewater derived from industrial sources or processes.

Non-potable (non-drinking) water^

Water not suitable for human consumption, e.g. by drinking or cooking.

Pathogen*

A disease-causing organism (e.g. bacteria, viruses and protozoa).

Potable (drinking) water*

Water suitable on the basis of both health and aesthetic considerations for drinking and culinary purposes.

Primary treatment

Sewage wastewater treatment that involves sedimentation to remove gross and settleable solids. Sludge is removed and treated separately.

Proponent*

Business or individual applying for approval for recycled water use.

Rainwater*

Water harvested directly from roof runoff from domestic buildings and captured in rainwater tanks.

Recycled water^

Water generated from sewage, greywater, stormwater, rainwater, industrial or animal processes and treated to a standard that is appropriate for its intended use.

Roofwater*

Water falling as precipitation collected from the rooftops of buildings.

Risk*

The likelihood of a hazard causing harm in exposed populations in a specified timeframe including the magnitude of that harm.

Risk assessment*

The overall process of using available information to predict how often hazards or specified events may occur (likelihood) and the magnitude of their consequences.

Risk management*

The systematic evaluation of the water supply system, the identification of hazards and hazardous events, the assessment of risks and the development and implementation of preventative strategies to manage the risks.

Secondary treatment

Treatment of primary sewage effluent by biological aerobic processes to remove organic matter. Usually followed by separation of solids from the liquid.

Sewage*

Material collected from internal household and other building drains. This includes faecal waste and urine from toilets, shower and bath water, laundry water and kitchen waste.

Source Water*

Water in its natural state, before any treatment to make it suitable for drinking.

Stormwater*

Water resulting from rain draining into urban stormwater systems from roofs (rainwater), roads, footpaths and other ground surfaces.

Supplier^

A person or organisation that has an approval to use recycled water, e.g. local council, sports ground, golf club.

Tertiary treatment

The treatment of sewage wastewater beyond the secondary biological stage. This involves the removal of a high percentage of dissolved and suspended solids followed by disinfection. May also include processes such as filtration.

User^

A person or organisation with approval to use recycled water, e.g. local council, sports ground, golf club.

Wastewater

Water that is collected and transported through sewers and septic tank effluent disposal schemes. Wastewater includes water from domestic and industrial sources.

Water Service+

A service constituted by the collection, storage, production, treatment, conveyance, reticulation or supply of water.

* Definition provided in the Australian Guidelines for Water Recycling (2006)

^Definition provided in the South Australian Recycled Water Guidelines (2012)

+Definition provided in the Water Industry Act 2012

1. INTRODUCTION

1.1 Purpose of This Guideline

This guideline has been prepared to assist departmental staff or contractors to use water in a sustainable manner on transport infrastructure projects. Where feasible and practicable, non-potable or recycled water should be used for civil construction, landscaping and maintenance activities for infrastructure projects.

1.2 What is Recycled Water?

For this guideline, recycled water is defined as a general term for water reclamation and reuse. Recycled water is produced from the treatment and storage of stormwater, in many cases in Aquifer Storage and Recovery (ASR) schemes, the reuse of industry waste waters (such as winery waste), and treatment and disinfection of wastewater from sewerage treatment plants which result in non potable water fit for a range of purposes. In some cases this water may be slightly more saline than potable mains water.

Recycled water may involve (ASR), which is the process of recharging treated stormwater into an aquifer for the purpose of storage and subsequent withdrawal. This is a method of enhancing water recharge into underground aquifers via gravity feeding or pumping excess water into the aquifers for later use at times of peak demand. The EPA's Code of Practice for Aquifer Storage and Recovery (2004) outlines the EPA requirements for ASR in line with the *Environment Protection Act, 1993 and Environment Protection (Water Quality) Policy 2003*.

Recycled water is suitable for landscaping, dust suppression and some infrastructure construction activities, toilet flushing, washing cars, managed irrigation, and other household garden and municipal uses. It is not suitable for human consumption.

1.3 Why Use Recycled Water?

In a dry state such as South Australia, we need to maintain environmental flows in our waterways and ensure our water resources are used wisely for the benefit of the whole community. The use of treated effluent and stormwater can bring significant economic benefits to the State and reduce impacts on the marine environment. South Australia is a world leader in stormwater and wastewater recycling and is continuing to diversify its' traditional sources of water to take pressure off the potable water supplies and return water to riverine ecosystems and communities.

Since the 1960's, large nutrient loads have been released into Adelaide marine waters from wastewater treatment plants and stormwater runoff. This has resulted in seagrass loss, degradation of riverine ecosystems and species loss. Urbanisation in South Australia has resulted in an increase in impervious surfaces and increased river velocities and reduced groundwater flow, which has degraded river channels and put pressure on riverine species including fish that require certain flow patterns to survive. The use of treated stormwater and wastewater reduces the impact of these sources on natural systems.

The department promotes sustainable use of water in road, rail, marine, civil construction and maintenance activities for infrastructure projects. The use of recycled/reclaimed water is a practical alternative to reduce the demand on potable water and freshwater sources.

1.4 Assessing Risks of Use of Recycled Water

Recycled water can be used for a variety of departmental activities including:

- Irrigation of landscaped areas or roadsides
- Dust suppression at construction sites or
- Road making, etc.

The suitability of the recycled water for the end use must be assessed to ensure it meets legislative health requirements and/or is suitable for desired construction applications. There are potential health risks that are associated with human contact in the case of public places irrigated with recycled water, and with exposure to aerosols generated by spray irrigation. Figure 1.1 provides an indication of the relevant risk associated with recycled water re-use based on water source and end use. A risk assessment should be undertaken to ensure risks are minimised and managed by using a combination of treatment requirements, site controls or sourcing water with a higher water quality rating. The procedure for assessment and approval for use of recycled water is outlined in Chapter 4.

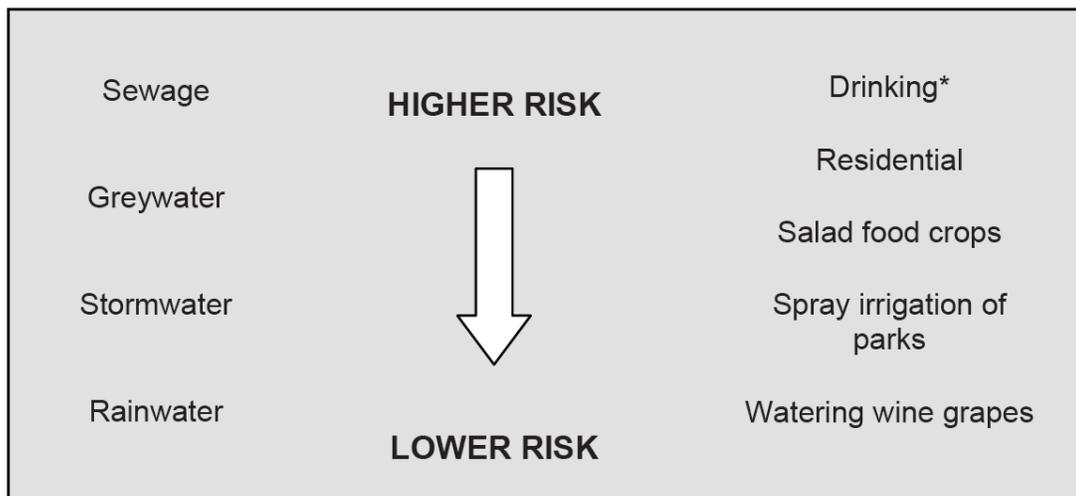


Figure 1.1: Relative risk associated with recycled water reuse, (source: Department of Health and Ageing (2012), *South Australian Recycled Water Guidelines*, pg 11)

2. STRATEGIC DIRECTIONS

2.1 South Australia's Strategic Plan

The South Australian Strategic Plan (2011) guides the community, government and business to secure the wellbeing of all South Australians. It contains the vision that "We value and protect our water resources" and the following goals and targets:

Goal: Industry and agriculture are highly efficient and innovative in their use of water.

Target 75: South Australia's water resources are managed within sustainable limits by 2018 (baseline 2003)

2.2 Water for Good

The Water for Good plan (2009) outlines 94 actions to ensure SA's water supplies are secure, reliable and sustainable for long term populations. It aims to ensure there will always be enough water in South Australia and enables the state to diversify its supplies to reduce its reliance on the River Murray and other rain-dependent water sources. It includes a number of reforms and actions including several relating to water recycling.

Currently Adelaide recycles more of its wastewater than any other capital city. Already 30% of our treated wastewater is recycled each year for irrigation use, toilet flushing and garden watering – and this is set to increase. A range of significant wastewater projects is under way to increase reuse to nearly 45%. Increased recycling of wastewater will provide more water for agriculture, community parks and gardens, and reduce the flow of nutrient discharge into the sea where it can harm the marine environment. Actions and outcomes in relation to water recycling are outlined in Table 2.1.

2.3 DPTI Green Plan

The Department's [Green Plan](#) is a response to the *Greening of Government Operations (GoGO)* framework. The plan outlines how the Department will minimise its ecological footprint and reduce use of resources including water use.

2.4 Water Allocation Plans

The eight Natural Resources Management (NRM) Boards are responsible for preparing Water Allocation Plans. They aim to ensure that the area's water resources are allocated fairly, taking into account the needs of all water users and the environment, by limiting how much water can be taken from each groundwater aquifer and river system. Water Allocation Plans give consideration to environmental water requirements and economic development.

The taking of water for construction does not require a licence, however the taking of water for landscaping or establishment of retention basins may require a licence. Refer to the local NRM Board for further information on Water Allocation Plans.

2.5 Water Affecting Activities Permits (WAAP)

The *Natural Resources Management Act, 2004* outlines provisions for the control of water affecting activities. Water affecting activities are defined in Section 127(5) of the Act and are activities that can have an impact on water resources and dependant ecosystems. A person must not undertake any Water Affecting Activities unless in accordance with the relevant Natural Resources Management Plan or Water Allocation Plan. These plans identify activities which are "water affecting activities" and which require a Water Affecting Activity Permit.

[DPTI's Water Affecting Activities Standard Operating Procedure \(#996501\)](#) outlines provisions that have been made within the various NRM Plans for the endorsement of a defined Best Practice Operating Procedures (BPOP). Where a BPOP has been approved by a NRM Board, an exclusion from requiring a permit for the defined water affecting activity may apply.

A Water Affecting Activity Permit may be required when using recycled water depending on the requirements of the Natural Resources Management Board.

For details of the extent and location of the different NRM regions follow the below links:

<http://www.nrm.sa.gov.au/Default.aspx>

<http://www.nrm.sa.gov.au/WhatisNRM/NRMBoundaries.aspx>

Table 2. 1 Water Recycling schemes actions and outcomes (Reference:Water for Good)

Recycled Water Scheme	Actions/Outcomes
Water Proofing Northern Adelaide	More than 20 integrated harvesting schemes
Metropolitan Adelaide Stormwater Reuse Project	Recycles 800ml a year to replace natural groundwater use in three metropolitan golf courses
Cheltenham Park	Expected 1.2gl harvesting capacity per year for irrigation, suitable for residential and potentially for industrial uses
Lochiel Park	Aims to achieve 78% savings in mains drinking water for each household compared to the average Adelaide household through the use of approximately 38ml of recycled water for toilet flushing, washing machine cold tap connection and irrigation, and by using rainwater collected in tanks for all household hot water. Approximately 87% of household and public space irrigation in Lochiel Park is supplied from recycled water.
Water Proofing the South	4.4gl per year for agricultural, viticultural and urban reuse of wastewater. This project also includes approximately 850ML a year stormwater recycling
Glenelg-Adelaide Parklands Recycled Water Project	1.3gl per year recycled water for Parklands use, with the capacity to recycle a total of 5.5gl a year
State wide Water Recycling Project	8.5gl a year reuse from local council Community Wastewater Management Schemes
Additional Bolivar Wastewater Treatment Plant Reuse	Playford Alive Blakeview Project
Aldinga Wastewater Treatment Plant	All treated water from this plant (approximately 328ml a year) is reused, predominantly by the Willunga Basin Water Company for local irrigators
Port Augusta West Sewer Mining Project	Recycles 180ml a year for irrigation of community parks and gardens
Whyalla Wastewater Reuse	Recycling 600ml a year to irrigate parks, gardens and a golf course
Victor Harbor Wastewater Reuse	Recycling 115ml a year to irrigate the golf course and a private vineyard
Berri Barmera Wastewater Reuse Project	Recycling 600ml a year for irrigation purposes
Loxton Waikerie Wastewater Reuse Project	Recycling to irrigate the local golf course
Extension of the Virginia recycled water pipeline to Angle Vale	Providing an additional 3gl a year, taking the total to 18gl a year of recycled water use
Bolivar and Christies Beach Wastewater Treatment Plants	About 40% of the wastewater from these plants is currently treated and reused
Country Wastewater Treatment Plants	High levels of reuse are currently occurring at some wastewater treatment plants, including Gumeracha, Mannum and Murray Bridge
Community Wastewater Management Schemes	Local Councils are achieving high levels of reuse from these schemes
Mawson Lakes	When fully developed Mawson Lakes will cater for approximately 10,000 residents. A major feature of the development is the innovative \$16 million water recycling system which complements the mains water supply. Recycled water is derived from sewerage systems and treated to a standard which is suitable for non-drinking purposes

3. RECYCLED WATER IN SOUTH AUSTRALIA

Recycled water can be sourced from waste water treatment plants, agricultural industries (vegetable washing waters), stormwater harvesting schemes and industry waste waters.

3.1 Wastewater Treatment Plants

Recycled water can be sourced from Waste Water Treatment Plants (WWTP) at various locations in metropolitan and regional South Australia.

In Adelaide the Bolivar, Christies Beach and Glenelg wastewater treatment plants supply recycled water to networks operated privately or as joint ventures. The pipeline network delivers water for irrigation of agriculture, viticulture and horticulture land use. See Figure 3.1 for a map of WWTPs within the Adelaide Metropolitan area.

There are 20 regional WWTP's elsewhere in the state which in total treat about 100 billion litres of wastewater per year. SA Water operates 19 of the plants with a private owner operating the Victor Harbor wastewater treatment plant.

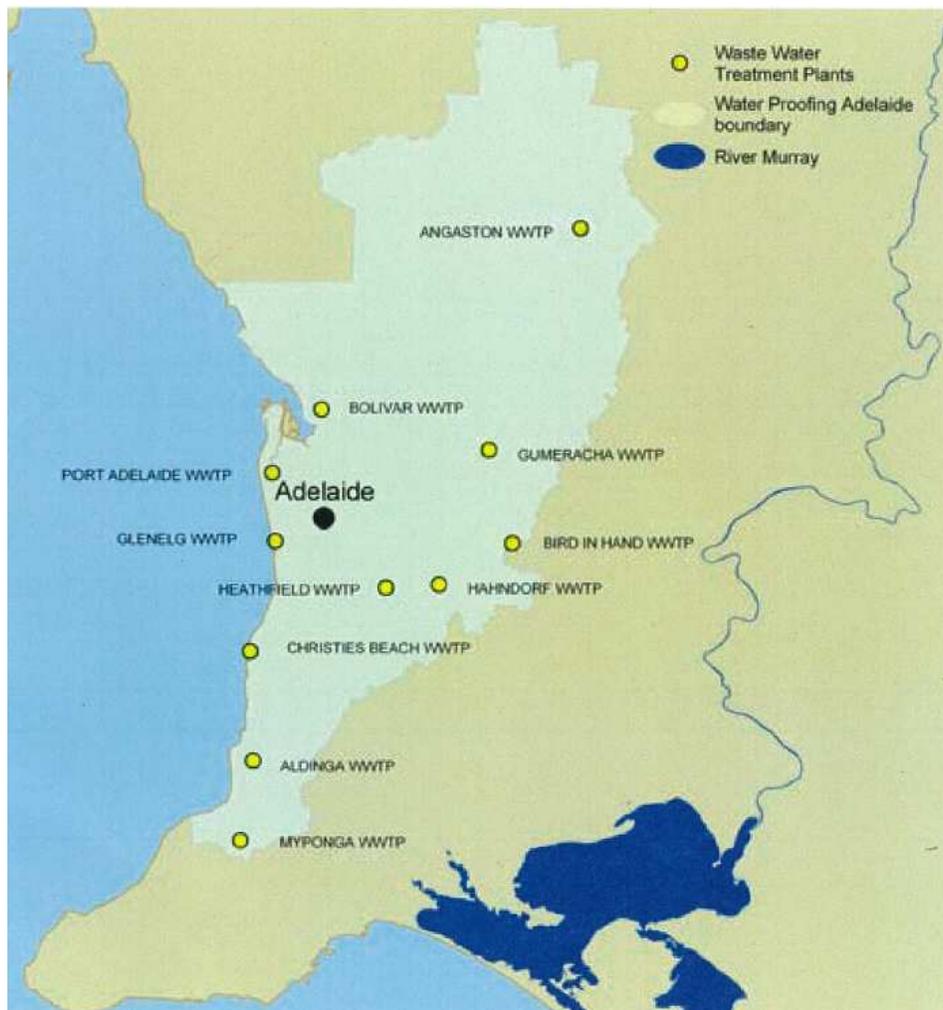


Figure 3.1: Location of wastewater treatment around the Adelaide Metropolitan area

Source: Water Proofing Adelaide Information Sheet

3.2 Stormwater Harvesting Schemes

There are numerous stormwater harvesting schemes within the Adelaide Metropolitan region including schemes at Mawson Lakes, within the City of Tea Tree Gully and Onkaparinga. For an up – to – date listing of operational stormwater harvesting schemes in SA visit <http://www.waterforgood.sa.gov.au/stormwater-wastewater/>. This is not an extensive listing of stormwater harvesting schemes within SA and regional towns may also have stormwater harvesting schemes operational.

3.3 Recycled Water Schemes and Locations

Within Adelaide and surrounding suburbs there are six large recycled water schemes that can be accessed for construction or irrigation purposes including Bolivar, Glenelg, Glenelg-Adelaide Parklands, Mawson Lakes, Tea Tree Gully and Willunga Basin. If your project is not located within close proximity to one of these schemes, you can contact the local Council for information on local recycled water schemes.

To determine if an existing recycled water network is located within your project area refer to Table 3.1 and the corresponding appendices for existing piping systems and fill station/standpipe locations. Further detail on each of the schemes listed is outlined below. The schemes listed below are within the Adelaide Metropolitan area. If your project site is outside this boundary you may consider contacting the local Council, WWTP, or local industry (eg winery) to see if recycled water is accessible within close proximity to your project site.

3.4 Glenelg to Adelaide Parklands Recycled Water Project

The Glenelg to Adelaide Parklands Recycled water project pumps treated water from the Glenelg WWTP to the Adelaide Parklands, which is mixed with mains water to produce high quality recycled water. This scheme is managed by SA Water and to gain access you must sign an Agreement of Supply with SA Water.

The water can be accessed via a pre-paid fill station or through the installation of a water meter. If your preferred option is the installation of a water meter there may be a waiting time associated with installation. SA Water only organise contracts for the installation of new water meters when 5 customers (at a minimum) want a meter. If you are the first person to request a meter it cannot be installed until 4 other people/organisations request a meter, depending on where you sit in the waiting list, it could take over a year until it is available.

Refer to Appendix B for maps of the scheme network (2012).

Contact: SA Water Customer Connections
Ph: 1300 650 951

Table 3. 1: Contacts for accessing recycled water schemes in Adelaide

Scheme	Water Management Authority	Access	Contract Documents	Contact	Appendix Reference
Glenelg-Adelaide Parklands (GAP)	SA Water	Water meter installation Fill Station (Pre-paid smart card)	SA Water – Agreement for supply of Recycled Water Department of Health and Ageing (SA) (DHA) - permit for use of wastewater	SA Water Customer Connections Ph: 1300 650 951	B
Mawson Lakes	SA Water	Water meter Fill Station (pre-paid smart card)	SA Water – Agreement for supply of Recycled Water DHA - permit for use of wastewater	SA Water Customer Connections Ph: 1300 650 951	C
City of Playford	City of Playford	Water meter or standpipe (with restricted access)	Playford – Agreement for the use of recycled water to be signed between DPTI and council DHA - permit for use of wastewater	Frank Lepore FLepore@playford.sa.gov.au or (08) 8256 0439 If Frank is unavailable contact Playford council direct on (08) 8256 0578	D
City of Salisbury	City of Salisbury	Pump station, street hydrants, water meter	Salisbury – Agreement for the use of recycled water to be signed between DPTI and council DHA - permit for use of wastewater	Michael Reavey mreavey@salisbury.sa.gov.au or 0401376404 If Michael is unavailable contact Salisbury council direct on (08) 8406 8222	E
City of Tea Tree Gully		Water meter or standpipe (with restricted access)	TTG – Agreement for the use of recycled water to be signed between DPTI and council DHA - permit for use of wastewater	David Baldwin David.Baldwin@CTTG.sa.gov.au If David is unavailable contact TTG council direct on (08) 8397 7444	F
Virginia Pipeline Scheme (Bolivar WWTP)	Water Reticulation Services Virginia	Water meter	Water Reticulation Services Virginia – Agreement for use of recycled water DHA - permit for use of wastewater	Tony White Ph: 0419 595 737 If Tony is no-longer working at Bolivar Contact SA Water for name of new contact.	G
Water Proofing the South	City of Onkaparinga, Willunga Basin Water Company		Onkaparinga – Agreement for the use of recycled water to be signed between DPTI and council DHA - permit for use of wastewater	Julian James, Commercial Officer - Water, on (08) 8301 7274 or email juljam@onkaparinga.sa.gov.au	H

3.5 Mawson Lakes Recycled Water Scheme

The Mawson Lakes recycled water scheme in the City of Salisbury has the highest quality recycled water available in South Australia and therefore has the fewest restrictions.

Owned and operated by SA Water, the Mawson Lakes Recycled water scheme produces high quality recycled water. Recycled water is sourced from the Bolivar WWTP and stormwater harvested at Salisbury that has been cleansed and treated through engineered wetlands and treated to a standard satisfactory for the intended end use. The water is supplied to residents at Mawson Lakes for irrigation, recycled toilet flushing, washing the car etc.

The water can be accessed via a pre-paid fill station that can be accessed using an access swipe card or through the installation of a water meter. The cost of water and metre installation can be negotiated during the agreement.

Refer to Appendix C for maps of the scheme location (2012).

Contact: SA Water Customer Connections
Ph: 1300 650 951

3.6 City of Playford

Playford Council own and operate various recycled water schemes within their Council area funded partly by the Federal Government under the Water Proofing Northern Adelaide (WNA) Project. The WNA is a collaborative project being undertaken by the Cities of Tea Tree Gully, Salisbury and Playford, with the assistance of a grant from the Australian Government Water Fund. In the City of Playford, WNA will help to provide up to 80% of water for irrigation. Key projects include developing major wetland sites and associated aquifer storage and recovery facilities at Munno Para West, Andrews Farm, and Adams Creek, along with a network of reticulation mains designed to deliver recycled stormwater to Council irrigation sites.

The water can be accessed through the installation of a water meter or by negotiating access to a standpipe (with restricted access). The Council will measure water usage based on the meter data to be billed on a monthly basis for the use of a standpipe. Costs for the installation of a meter can be negotiated, depending on the number of sites connected. Generally Council supplies the meter and it is installed on the boundary, however if there is a large number of meters required, then cost may need to be negotiated.

Refer to Appendix D for maps of the scheme location (2012).

Contact: Frank Lepore
Email: FLepore@playford.sa.gov.au or
Ph: (08) 8256 0439

3.7 City of Salisbury

Salisbury Council own and operate various recycled water schemes within their Council area, with an extensive network of wetlands, bio-retention systems and aquifer storage and recovery, etc. Most of the rainfall in the Council area is received during winter and ASR is used to store the water for year round access. The recovered water is pumped to storage tanks which are part of automated pump stations that deliver the recycled stormwater to customers via a purple pipe recycled water reticulation network. The Mawson Lakes Scheme is within the Salisbury Council area; however this scheme is managed by SA Water (see section 3.5).

Recycled water within the Salisbury Council area can be accessed via a pump station, street hydrant or through the installation of a water meter. To access a pump station the contractor is provided with a key, cost for the water is negotiated based on how much water is required and the

meter is measured and a bill is sent each quarter. Approximately 20 hydrants within the Council area contain recycled water that can be accessed if requested; the estimated water pressure is greater than 500kpa and should supply at 10 litres per second. If you require a permanent water connection you can negotiate for the connection of a new water meter along their existing pipe network. The cost for installation can be negotiated and water use will be measured and recorded each quarter.

Refer to Appendix E for maps of the scheme location (2012).

Contact: Michael Reavey
Email: mreavey@salisbury.sa.gov.au
Ph: 0401376404

3.8 City of Tea Tree Gully

Tea Tree Gully Council own and operate various recycled water schemes within their council area funded partly by the Federal Government under the Waterproofing Northern Adelaide Project. The Mahogany Wetland, Dernancourt and the Kingfisher Wetland, Modbury Heights are now complete, and a third project within the City of Tea Tree Gully - Settlement Wetland, Yatala Vale - is in progress (Tea Tree Gully Council 2011).

Water can be accessed through the installation of a water meter or restricted access to a standpipe within the Council area. The cost of the water metre installation and cost of the water per kilolitre can be negotiated with the Council prior to setting up the scheme. Access to standpipes can be arranged through access to a key and recording water usage, generally the more water required the lower the cost.

Refer to Appendix F for maps of the scheme location (2012).

Contact: David Baldwin
Email: David.Baldwin@CTTG.sa.gov.au

3.9 Virginia Pipeline Scheme (Bolivar WWTP)

The Bolivar WWTP distributes water to irrigators through the Virginia Pipeline Scheme operated by Water Reticulation Services Virginia (WRSV). The water collected at the WWTP is allocated to provide water to irrigators within the region, however sometimes excess water may become available and can be accessed at a cost. The underground network is located within a 6km radius of the WWTP (approximately) and can be accessed through the installation of a water meter.

Refer to Appendix G for maps of the scheme location (2012).

Contact: Tony White
Ph: 0419 595 737

3.10 Water Proofing the South (City of Onkaparinga)

Onkaparinga Council in conjunction with the Willunga Basin Water Company manages the Water Proofing the South recycled water scheme. The scheme is based in the City of Onkaparinga and sources water from the Christies Creek and Aldinga WWTPs and various stormwater harvesting schemes in the region including wetlands and managed aquifer storage and recovery schemes, with plans to expand the network in the future. Networks are available in Morphett Vale through Christies Beach; Reynella; Seaford; Moana and Aldinga (see Appendix H for further details). The Council is also happy to discuss network extensions where it is commercially viable to do so.

Water is provided via either supply point or meter for sites with fixed demands such as irrigation and through relocatable metered hydrants for activities such as dust control or tree watering. Water

is priced at 80% of SA Water's mains water price. Meters provide a take off point and the customer can reticulate the water to where it is needed. Hydrants are suitable for carrying in a vehicle are about 1200mm long and thread into valves along our networks. They can be operated by a single person.

Onkaparinga Council has both recycled effluent and harvested stormwater schemes with the majority being stormwater. Stormwater is treated to a level that is fit for purpose for Open Spray Irrigation - refer [Australian Guidelines for Water Recycling: Managing Health and Environmental Risks \(Phase 2\): Stormwater Harvesting and Reuse](#). No Department of Health and Ageing (SA) approval is required for stormwater but they require a risk management plan to be prepared as it is not drinking water. Recycled Effluent is treated to Municipal Use standards in accordance with the [South Australian Recycled Water Guidelines \(2012\)](#) produced by the Department of Human Services and the Environment Protection Agency. Department of Health and Ageing (SA) approval is required for recycled effluent use.

Refer to Appendix H for maps of the scheme network (2012).

Contact: Julian James
Ph: (08) 8301 7242 or 0449 505 847
Email: juljam@onkaparinga.sa.gov.au

4. PROCEDURE FOR USE OF RECYCLED WATER

Desirably, recycled water should be the first preference for the irrigation of landscaping and dust control on construction sites rather than using potable water. Alternative water sources to mains supply should be investigated and identified and used where viable.

When sourcing recycled water for projects, an Agreement for the use of the recycled water must be established with the Water Management Authority for the relevant scheme. Generally this Agreement will outline how much water will be sourced, the duration of the Agreement and an agreed cost per kl. The cost per kl is generally lower if a higher volume of water is required. Figure 4.1 (next page) outlines the procedure for investigating options to access recycled water within South Australia.

When sourcing recycled water for construction or irrigation purposes, check that the water quality is fit for purpose. Some nutrients can impact the health of plants or compromise the structural integrity of infrastructure materials including cement and asphalt.

Figure 4.1 outlines the procedure for assessing and seeking approval for the use of recycled water.

4.1 Recycled Water Risk Assessment and Management Plans

The use of recycled water is encouraged provided it is undertaken in a safe and sustainable manner. However, the quality of the water, the method of distribution, and the reuse purpose must be assessed to prevent public health risks and adverse environmental impacts. Reuse is only allowed for non-potable (not for human consumption) purposes.

The Australian Guidelines for Water Recycling (Phase 1) have adopted a risk management approach to the management of recycled water systems to ensure safety and the protection of public and environmental health. This approach applies to stormwater, wastewater and industry waste waters and is particularly important for high exposure applications such as dual reticulation and unrestricted irrigation. The level of information required corresponds to the size, complexity and nature of the recycled water scheme. For example, a risk management plan for the supply of recycled treated sewage for dual reticulation will be much more detailed with more specifications than a risk management plan for use of recycled water for irrigation of a park or dust suppression. A risk assessment identifies the restrictions for end-use and the safety measures that must be implemented for the scheme.

Potential risks, hazards and management measures should be identified and outlined in contract documentation and the Contractor's Environmental Management Plan prior to commencing any activity(s) using reclaimed water.

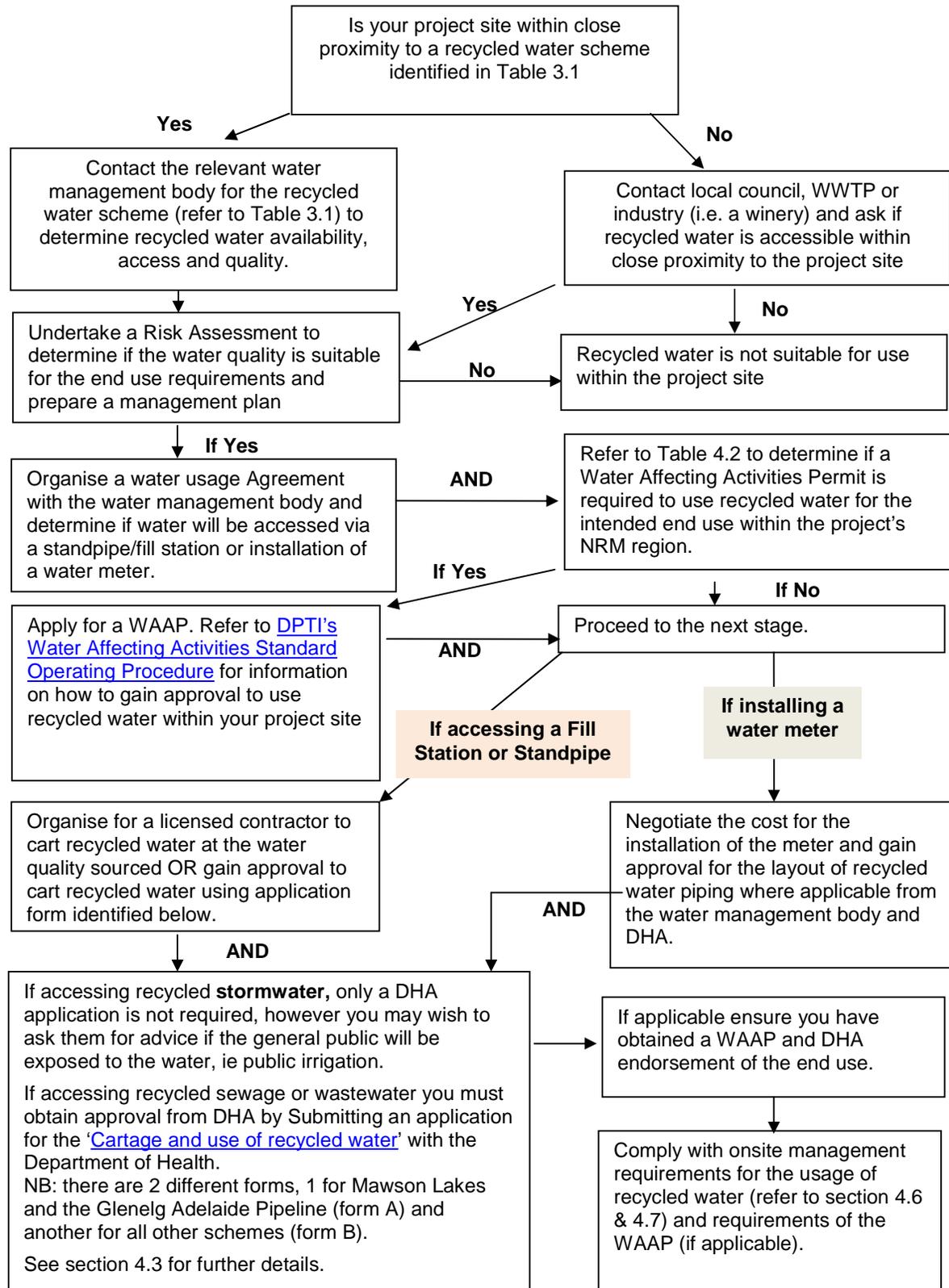


Figure 4.1: Procedure for the use of recycled water

4.2 A Water Affecting Activity Permits

If your project intends to utilise recycled effluent or wastewater or involves importing recycled water from one NRM region for use within another NRM region, you may be required to apply for a Water Affecting Activities Permit (WAAP).

Water affecting activities permits may be required when using recycled water depending on the requirements of the NRM Board. The table below summarises under what conditions a WAAP application is required within the different NRM Regions for the use of recycled water.

If your project requires a WAAP refer to Section 2.5 and [DPTI's Water Affecting Activities Standard Operating Procedure \(#996501\)](#) for information on how to apply for a WAAP.

Table 4. 1: When to Apply for a WAAP if using recycled water by NRM Region

NRM Region	Restrictions for use of recycled water	Conditions under which a WAAP must be applied for to use recycled water	Covered by DPTI's Water Affecting Activities BPOP
Adelaide and Mount Lofty Ranges	Yes	If recycled effluent waster is used at a rate that exceeds 1ml/Ha/yr.	No
Alinytjara Wilurara	N/A	N/A	N/A
Eyre Peninsula	Yes	If recycled effluent waster is used at a rate that exceeds 1ml/Ha/yr. If you are importing recycled water from another region for use in the Eyre Peninsula NRM Board.	No
Kangaroo Island	Yes	If you are importing recycled water from another region for use in the KI NRM Board.	No
Northern and Yorke	Yes	If recycled effluent or water imported from another region is used at a rate that exceeds 1ml/Ha/yr	No
SA Arid Lands	N/A	N/A	N/A
South Australian Murray-Darling Basin	Yes	If recycled effluent waster is used at a rate that exceeds 1ml/Ha/yr for irrigation (more than 100mm depth of irrigation) or 1ml/yr for non-irrigation activities	No
South East	N/A	N/A	N/A

For details of the extent and location of the different NRM regions follow the links below:

<http://www.nrm.sa.gov.au/Default.aspx>

<http://www.nrm.sa.gov.au/WhatisNRM/NRMBoundaries.aspx>

4.3 Approval for the Use of Recycled Water

There are limitations and guidelines for the use of recycled water by the South Australian Department of Health and Ageing, SA (DHA) to ensure safe handling and carting practices. All carting and activities defined under the [South Australian Recycled Water Guidelines \(2012\)](#) are subject to *Public and Environmental Health Act 1987*, enforced by DHA. The DHA has access to data on the water quality of most publically accessible recycled water schemes within the Adelaide metropolitan region.

Approval must be obtained before a recycled water reuse scheme is installed or before recycled water is carted or used on a project site. 'Application for Approval of Commercial Cartage and Use

of Recycled Water' must be lodged with DHA. Fees apply for applications, for current fees phone (08) 8226 7100. There are 2 different forms; Form A: Mawson Lakes and Glenelg; and Form B: Other wastewater treatment plants. The forms are available at: <http://www.dh.sa.gov.au/pehs/topics/drought-package.htm>

Refer to the DHA Wastewater Fact Sheet, [Recycled water systems: information guide for applicants](#) for details required when submitting an application.

Spray drift control – Control of spray drift is of particular importance when recycled water is used for municipal irrigation, both for users of the area irrigated and for users of adjacent areas. Restrictions are specified for Spray drift control in the [Australian Guidelines for Water Recycling \(Part 1\)](#).

The [Irrigation with Recycled Water: Information Guide for Applicants \(2009\)](#) details the information to be provided when making an application to DHA for approval to use high quality Recycled Water suitable for unrestricted irrigation.

Note, the DHA does not regulate the use of *Recycled Stormwater*, however, DHA generally comment on its' use from a health perspective, eg, if the recycled water is used for irrigation purposes, then public exposure may occur. The DHA regulates the use of recycled wastewater from a sewerage treatment plant. When sourcing this type of recycled water, DHA approval is required prior to use.

4.4 Carting of Recycled Water

Commercial licenced carters are subject to conditions specified in their licences. Each licensed carter has approval for a specific application. For extra information on licenced recycled water carters in South Australia, contact the Department of Health and Ageing (SA) on (08) 8226 6000 and ask for the Water Quality Section. Alternatively, contact SA Water's Business Development Manager Joe Lazzaro on (08) 7424 1379.

If a contractor wishes to cart the water themselves they need to complete the application from DHA 'Application for Approval of Commercial Cartage and Use of Recycled Water' (Section 4.1) and obtain approval. The conditions of approval include:

- Use carting truck solely for the purpose of carting recycled non potable water;
- Clearly sign vehicle;
- Maintain a log book which includes the date, source location, delivery point, volumes, and truck details.; and
- Provide OHS&W training for staff.

The DHA [Guidelines for the Carting of Recycled Water](#) provide information on recycled water cartage, uses, providers, the approval process, and additional requirements.

The Contractor must comply with *DHA* and *SA Water* standards and guidelines for the use of recycled water. See section 3.4.1 of the [South Australian Recycled Water Guidelines \(2012\)](#) for further information on how to cart recycled water.

The transport of recycled water is not subject to the Environment Protection Authority (EPA) prescribed waste regulations, however there must be procedures in place to ensure that there are no spillages, odour, or contamination of water.

4.5 Accessing or Installing a Water Meter

Recycled water schemes often have underground recycled water pipes that can be accessed by an existing meter or you can request that a new meter be installed for your project. The water management body will suggest what method will be best fit for purpose. A meter may be installed for new irrigation schemes or projects that are expected to be under construction for an extended period and will require water supply for dust suppression, etc. If a meter is installed for irrigation or another permanent recycled water purpose approval must be obtained from the Department of Health and Ageing (SA) for the connection (see below).

4.5.1 Cost

There is usually a cost associated with the installation of a water meter, an annual supply fee and the cost of water per kl is determined based on usage (usually the higher the usage the lower the cost per kl). This should be discussed with the relevant Water Management Body.

4.5.2 Approval for Piping

When piping is installed for a permanent recycled water pipeline, the pipe work must be lilac and be appropriately marked so that it can be identified as recycled water piping and the layout must be approved by the relevant water management authority to ensure that it is not connected to any mains water or could 'back-flow' into a mains waterline to prevent cross-contamination of mains water. See section 3.6.3 of the [South Australian Recycled Water Guidelines \(2012\)](#) for further information on cross connections and backflow protection.



Recycled Water Tap, lilac piping for identification

4.6 On-site Controls

RECYCLED WATER



4.6.1 Signage

Signage is an important part of risk management. Provide appropriate signage wherever recycled water is used in accordance with DHA specifications for carting trucks and landscape irrigation systems. When using recycled water signage must be installed in accordance with Appendix 3.4 of the [Australian Guidelines for Water Recycling \(Part 1\)](#).

4.6.2 Staff Training

Staff should be inducted on the site and be familiar with all external recycled water outlets, application of its use, and best practices when using recycled water. It is important to emphasise the importance of maintaining best practices to reduce risks when using recycled water. Include onsite induction with Occupational, Health and Safety procedures for all on-site personnel (awareness and training).

4.6.3 Public Access

No restriction of public access is required when DHA approved high quality recycled water is used. Restrictions on public access or limits on irrigation times could be required for specific schemes. Ensure recycled water taps in public areas are either locked or have adequate signage indicating the water is not for human contact.

4.6.4 Control of Application Methods

Methods used for the application of recycled water must be controlled (ie spray, drip). Spray irrigation, commonly used for dust suppression, should be conducted using devices that are designed to minimise the production of aerosols.

4.6.5 Control of Application Rates

If necessary, application rates of recycled water need to be controlled so that irrigation provides the maximum benefit, while also minimising the impacts on the immediate and surrounding environments (including soil, surface water, and groundwater).

4.6.6 Control of Application Times

Potential exposure to recycled water can be reduced if necessary by limiting the time of application; eg night time only. The effect of this is a reduced amount of recycled water being evaporated and few personnel being exposed to the recycled water (National Water Quality Management Strategy (NWQMS) 2006).

4.6.7 Use of Buffer Zones

In general, buffer zones are not required for high-quality recycled water suitable for domestic (non-potable) water use. However, buffer zones may be used to reduce human and environmental exposure to recycled water and to enable the use of lower quality recycled water (NWQMS 2006).

4.6.8 Runoff

Runoff to waterways and neighbouring sites must be prevented by controlling drainage and runoff. Parameters must be included in the Soil Erosion and Drainage Management Plan.

4.6.9 Odours

Ensure that recycled water does not pool on site as it may become septic and produce an unfavourable odour. Flush the equipment used with freshwater to reduce the impact of the odour.

4.6.10 Licenses

If using recycled water on your project site, ensure you comply with any license/approval requirements for end use specified by DHA or the water management body for the quality of water being accessed.

4.7 Occupational Health and Safety

Disease causing pathogens can be found in recycled water depending on its source and the level of treatment the water has undergone. For example, the higher the level of treatment the water has undergone the lower the level of pathogens present. Users of recycled water need to reduce the risk of exposure to pathogens by controlling human exposure to recycled water.

Occupational exposure to recycled water can be managed by minimising contact, ingestion and exposure to aerosols.

Personnel engaged in any type of operation involving recycled water should take the following precautions and also follow Occupational, Health and Safety Protocol from the workplace.

- Avoid ingestion and unnecessary exposure to aerosols and sprays of recycled water.
- Wash hands before eating and drinking, and at the end of each working day.
- Cover any broken skin (ie wounds, cuts, abrasions).

- Wear appropriate clothing, where required (to be specified by DHA when application for use of water is lodged, section 4.1).
- Use appropriate safety equipment where required (to be specified by DHA when application for use of water is lodged, section 4.1).

5. REFERENCES FOR FURTHER INFORMATION

Recycled Water Usage Information and Application Forms:

Depending on which scheme you source your water from a different application form must be lodged with the Department of Health and Ageing (SA). There is one form for the Mawson Lakes and the Glenelg to Adelaide Parklands scheme (as the water quality from these schemes is of high quality) and another for most other recycled water schemes. Visit <http://www.dh.sa.gov.au/pehs/topics/drought-package.htm> to access the forms or contact DHA direct at public.health@health.sa.gov.au or phone (08) 8226 7100.

Department of Health and Ageing (SA), *Wastewater fact sheet – Recycled water systems: information guide for applicants* <http://www.health.sa.gov.au/pehs/PDF-files/0903-Recycled-Water-Application-Guide.pdf>

This document provides information on the application process and requirements for recycled water schemes

Department of Health and Ageing (SA) (2008), *Guidelines for the Carting of Recycled Water* <http://www.health.sa.gov.au/pehs/PDF-files/ph-factsheet-carting-recyc-water.pdf>

Guidelines:

Environment Protection and Heritage Council (2006), *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1) 2006*
<http://www.ephc.gov.au/taxonomy/term/39>

This national guideline provides guidance on best practices for water recycling. It provides a risk assessment framework for the treatment and reuse of recycled water and is intended to be used by anyone involved (including government agencies) in the supply, use and regulation of recycled water systems.

Environment Protection and Heritage Council (2009), *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2): Stormwater Harvesting and Reuse*
<http://www.ephc.gov.au/taxonomy/term/39>

Department of Health and Ageing (2012), *South Australian Recycled Water Guidelines*
http://www.sahealth.sa.gov.au/wps/wcm/connect/412d39004d1e315b8a26fe2ba18c3740/Guideline_SA+Recycled_Water_Guidelines_Oct2012.pdf?MOD=AJPERES&CACHEID=412d39004d1e315b8a26fe2ba18c3740

These guidelines describe methods by which recycled water including wastewater and stormwater can be used in a sustainable way without imposing unnecessary risks to public health or the environment.

Websites:

Department of Environment, Water and Natural Resources, *Managed Aquifer Recharge Regulations in South Australia*, <http://www.waterforgood.sa.gov.au/stormwater-wastewater/managed-aquifer-recharge/mar-regulation-in-south-australia/>

Department of Environment, Water and Natural Resources, *Stormwater and Wastewater*,
<http://www.waterforgood.sa.gov.au/stormwater-wastewater/>

This page provides a map of stormwater harvesting scheme locations in SA

Department of Environment, Water and Natural Resources, *Wastewater*,
<http://www.waterforgood.sa.gov.au/stormwater-wastewater/wastewater/>

This page contains information on significant wastewater projects in SA

Department of Health and Ageing (SA), *Reclaimed Water Use – Treated Effluent*
<http://www.health.sa.gov.au/pehs/branches/wastewater/reclaimed-water.htm>

This page provides information on the use of reclaimed water, as well as links to application guides and other government agencies licensing requirements.

Department of Sustainability, Environment, Water, Population and Communities, *Water policy and programs* <http://www.environment.gov.au/water/policy-programs/index.html>

SA Water, *Our wastewater systems overview*,
<http://www.sawater.com.au/SAWater/Education/OurWastewaterSystems/>

Primary Industries and Regions South Australia, *Water Intensive Development*, Access 17/10/2012, http://www.pir.sa.gov.au/wid/water_resource_management/recycled_water

See <http://www.environment.gov.au/water/policy-programs/water-smart/projects/sa08.html> for further information on the Water Proofing Northern Adelaide project.

See

http://www.onkaparingacity.com/onka/living_here/our_environment/water_management/water_proofing_the_south.jsp for further information on the Water Proofing the South project

Plans and Strategic Documents:

SA Government (2011) *South Australia's Strategic Plan*
<http://saplan.org.au/pages/download-the-plan>

Department for Water (2010) *Water for Good: A plan to secure our water future to 2050*,
<http://www.waterforgood.sa.gov.au/water-planning/the-plan/>

Department of Sustainability, Environment, Water, Population and Communities (website) *Water Proofing Northern Adelaide*, <http://www.environment.gov.au/water/policy-programs/water-smart/projects/sa08.html>

City of Onkaparinga (website) *Water Proofing the South*,
http://www.onkaparingacity.com/onka/living_here/our_environment/water_management/water_proofing_the_south.jsp

Water Restrictions:

When Level 3 water restrictions are in place, building/construction activities must not use water for dust suppression and compaction unless it is applied from a hand held hose fitted with a trigger nozzle or directly from a motor vehicle designed and approved to carry/deposit water. For more information on water restrictions phone SA Water on 1800 130 952 or visit:

SA Water (2010), *Water Wise Measures Overview*,
http://www.sawater.com.au/sawater/environment/wwm/wwm_overview.htm

Groundwater:

SA Government, *Water, energy and environment: Groundwater*,
<http://www.sa.gov.au/subject/Water,+energy+and+environment/Water/Water+resources+in+SA/Groundwater>

Other:

Other documents relating to Water Recycling and Reclaimed Water can be found at:

- The EPA website (<http://www.epa.sa.gov.au/>),
- The Australian Government's water website (<http://www.environment.gov.au/water/>)
- The South Australian Government's water website (<http://www.waterforgood.sa.gov.au/>)

APPENDIX A – LEGISLATION

This Appendix provides a brief overview of the key legislation, policy and guidelines related to using and managing recycled water. For a copy of the legislation visit:

<http://www.legislation.sa.gov.au/index.aspx>.

Environment Protection Act, 1993

This Act regulates polluting activities and ensures that measures are taken to protect, restore and enhance the quality of the environment. Section 25 requires a “duty of care” to not pollute and to prevent environmental harm.

Environment Protection (Water Quality) Policy, 2003

This policy was developed to achieve the sustainable management of waters throughout South Australia. It applies to all inland surface, ground water and marine waters and covers a range of issues including water quality, water management and pollution.

Natural Resources Management Act, 2004

Chapter 7 of this Act defines provisions for the management and protection of water resources. Under sections 127 (3) and (5) of the *Natural Resources Management Act*, a permit is required for activities affecting a watercourse unless the works are approved under another Act such as the *Development Act, 1993*, *Environment Protection Act, 1993* or the *Native Vegetation Act, 1991*.

The *Natural Resources Management Act* provides the opportunity for each Natural Resource Management Board to define what activities require a permit in their Natural Resources Management Plan. Some Natural Resources Management Boards class the use of recycled effluent water or the act of importing recycled water from another region into their region a Water Affecting Activity, and as such these activities may require a Water Affecting Activities Permit.

Public and Environmental Health Act, 1987

This Act provides standards of public and environmental health in South Australia and is a key element in the matters relating to water recycling and enforcement of standards.

Public and Environmental Health (Waste Control) Regulations, 2010

These regulations apply to authorities operating recycled water schemes. The regulations require approval of the sale, installation, operation and maintenance of all wastewater systems in the state, including recycled water systems. Local government administers approvals of wastewater systems covered by a prescribed code while the regulations provide authority for the Department of Health and Ageing (SA) to approve installation of all wastewater infrastructure and sale of wastewater products for use in South Australia.

Regulation 8 - Disposal or use of waste states that:

A person must not dispose of, or reuse, waste from a waste control system except as approved by the relevant authority under these regulations.

Regulation 13 - Approval of disposal or reuse of waste states that:

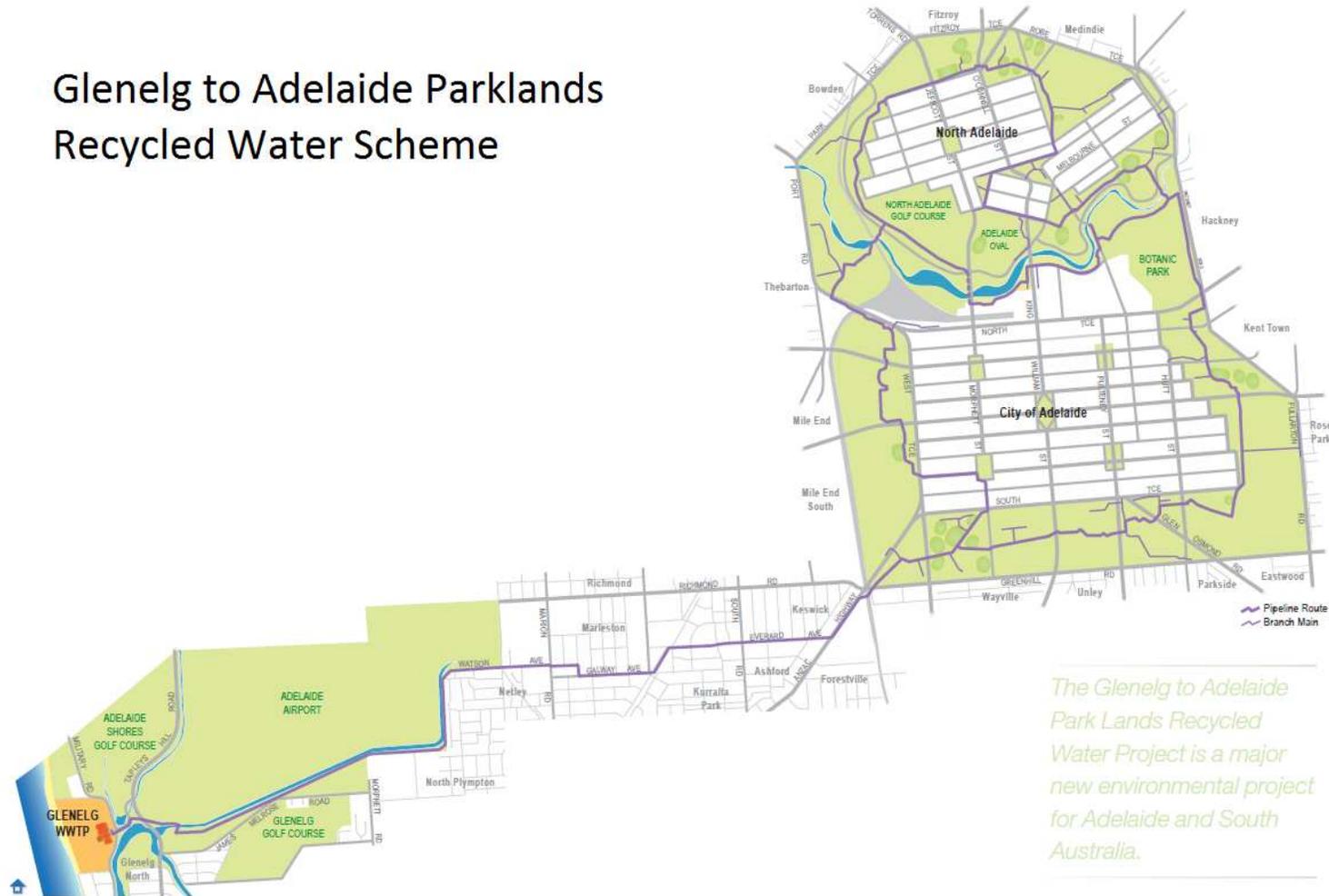
Where the disposal, or reuse, of waste from a waste control system involves an activity for which a permit is required under section 127 of the Natural Resources Management Act 2004, the relevant authority must not grant its approval for the disposal, or reuse, of the waste unless -

- (a) the permit required under section 127 of the Natural Resources Management Act 2004 has been granted and is in force; or*
- (b) the approval does not operate until such a permit has been granted.*

For further details see Appendix A of [South Australian Recycled Water Guidelines \(2012\)](#) for formal and legislative requirements when accessing recycled water.

APPENDIX B – ACCESS GLENELG TO ADELAIDE PARKLANDS RECYCLED WATER SCHEME

Glenelg to Adelaide Parklands Recycled Water Scheme

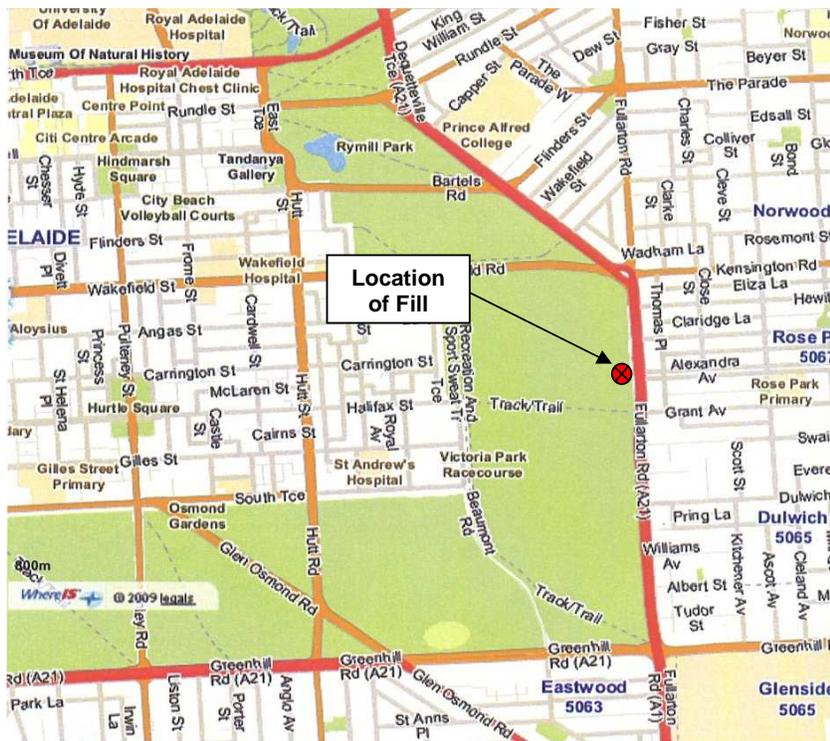
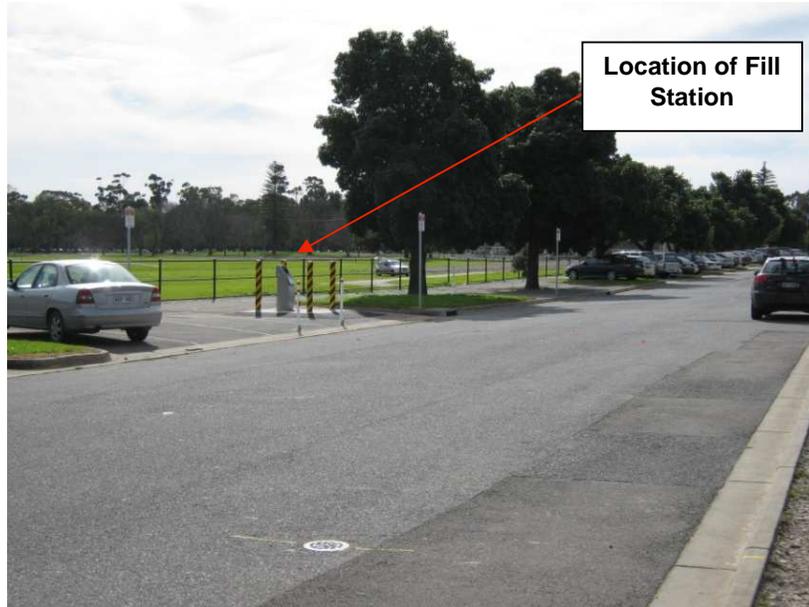


LOCATION MAP

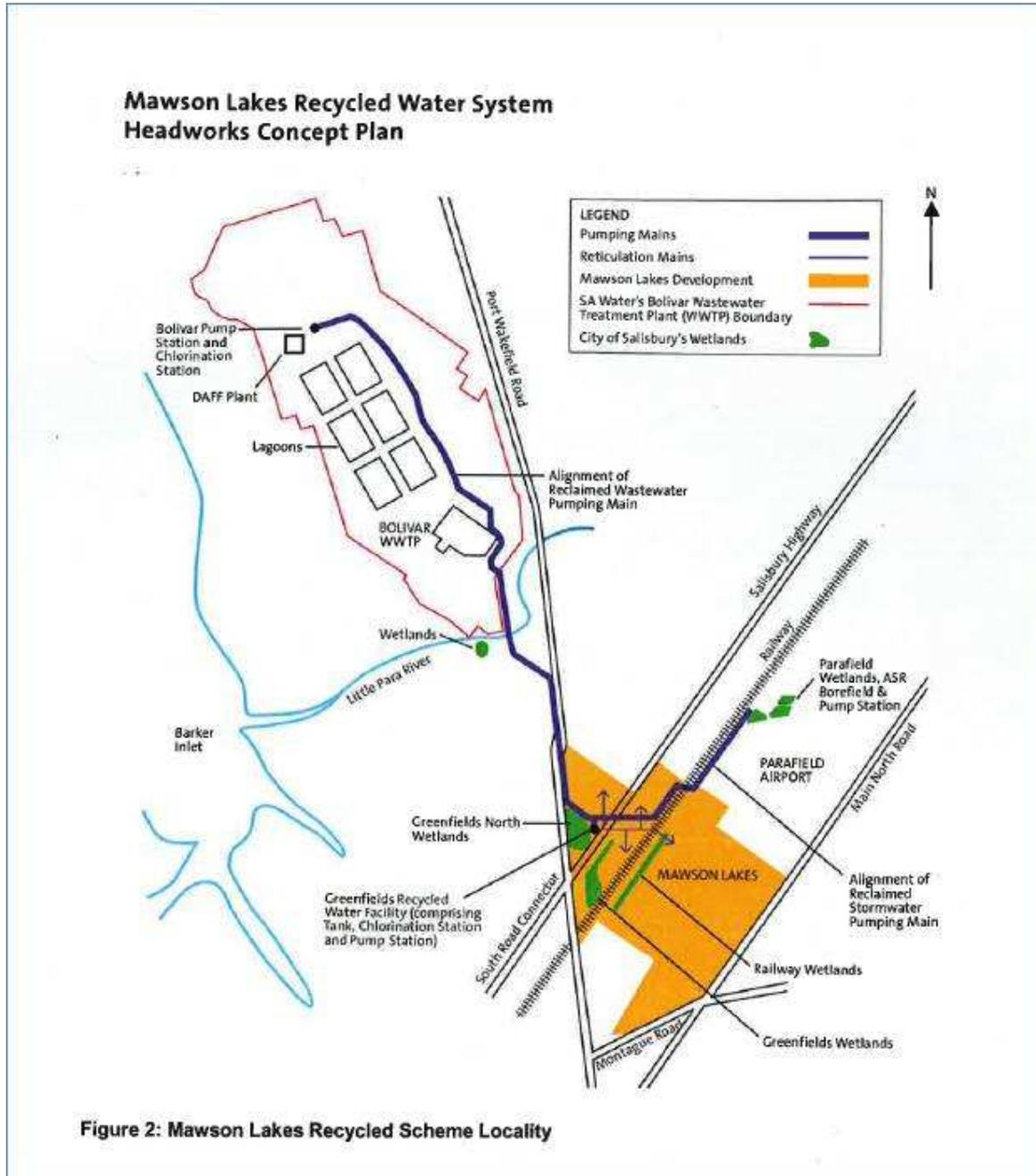
GAP Recycled Water Filling Station – War Memorial Drive



LOCATION MAP GAP Recycled Water Filling Station – Victoria Park



APPENDIX C – ACCESS MAWSON LAKES RECYCLED WATER SCHEME

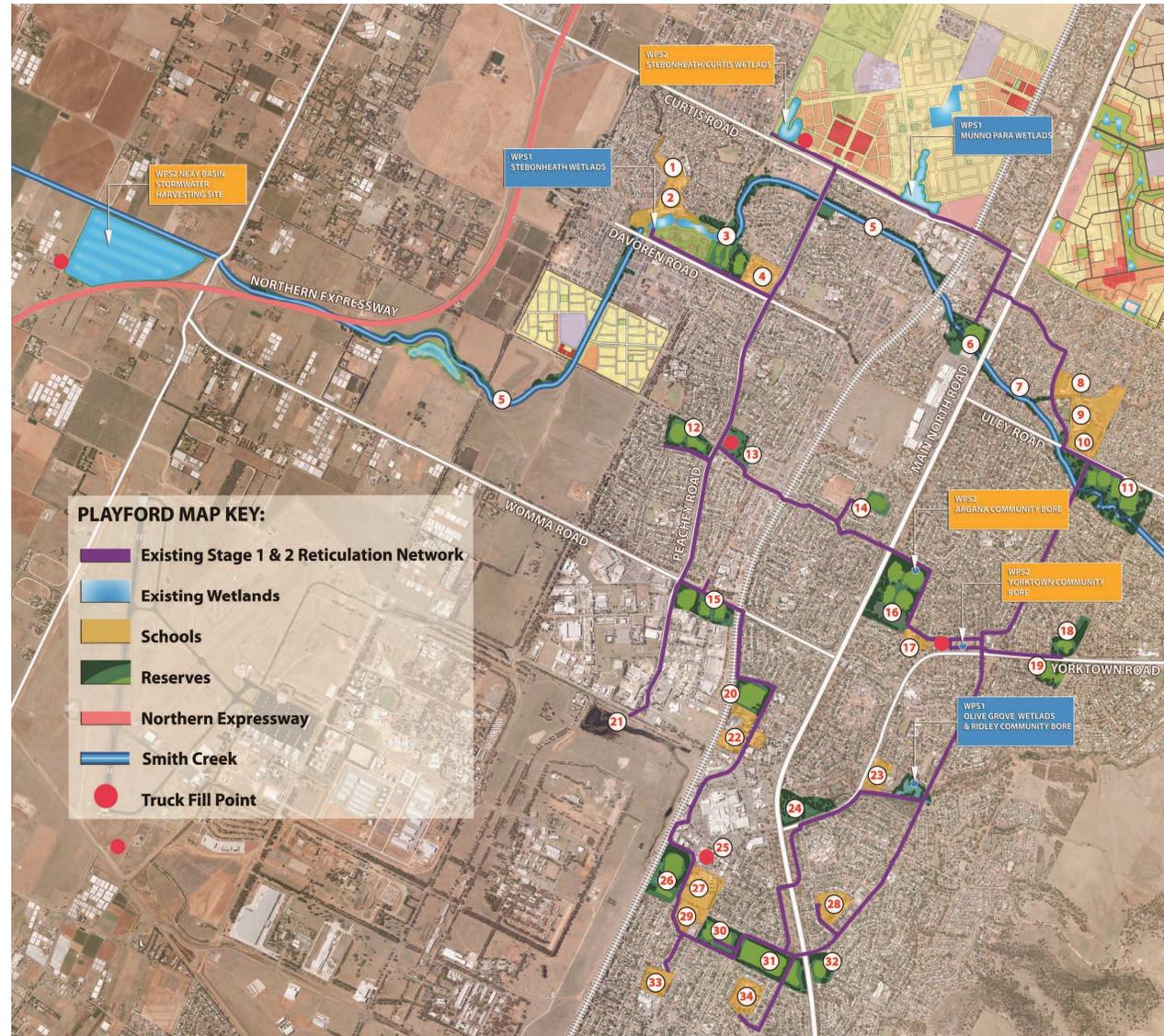


LOCATION MAP

GAP Recycled Water Filling Station – Mawson Lakes

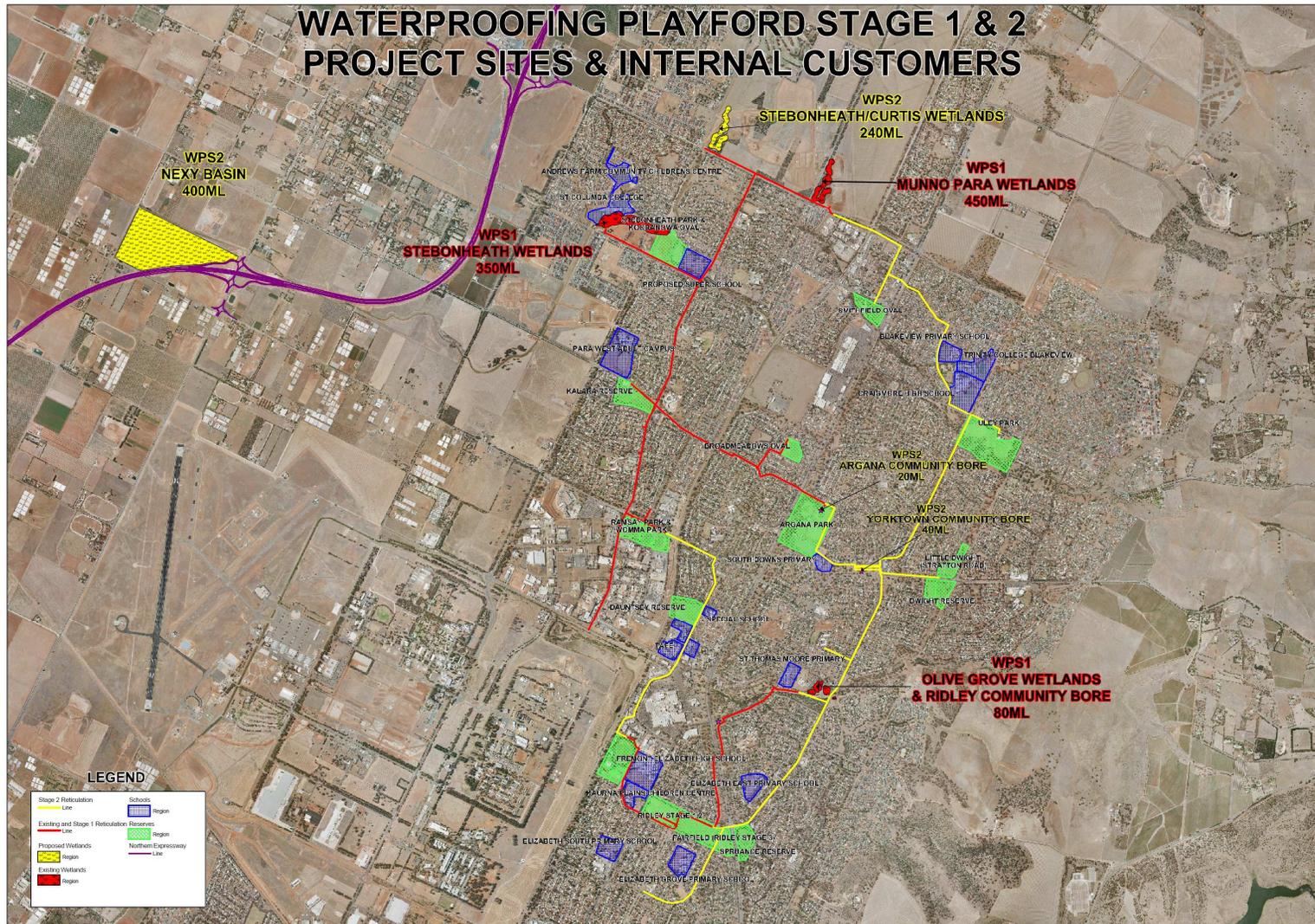


APPENDIX D – ACCESS CITY OF PLAYFORD RECYCLED WATER SCHEME



PLAYFORD MAP KEY:

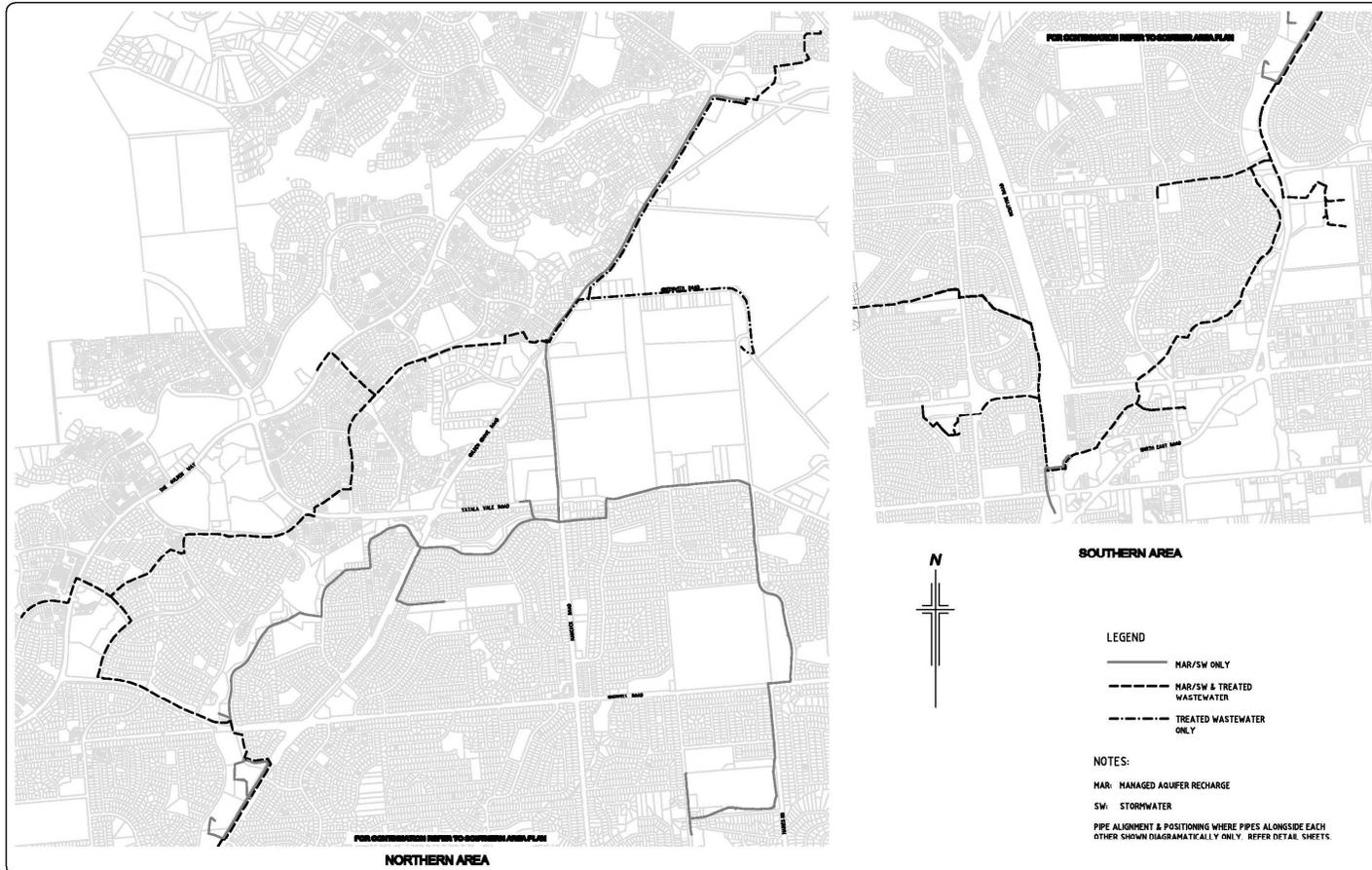
- Existing Stage 1 & 2 Reticulation Network
- Existing Wetlands
- Schools
- Reserves
- Northern Expressway
- Smith Creek
- Truck Fill Point



APPENDIX E – ACCESSING CITY OF SALISBURY RECYCLED WATER SCHEME

See [Knet # 7136425](#) Map provided by the City of Salisbury –
to be treated as confidential and not to be distributed to
people outside the department.

APPENDIX F - ACCESS CITY OF TEA TREE GULLY RECYCLED WATER SCHEME



For a Higher resolution map – see [knet 7128599](#)

No.	Amendments	Date	Approved	Title
1	AS CONSTRUCTED ISSUE ADDITIONAL EXTENSION PIPEWORK	30/11/11		
2	CERTIFICATION ISSUE	21/11/13		

Services to be relocated		Responsible Organisation
Water		
Gas		
Electricity		
Other		

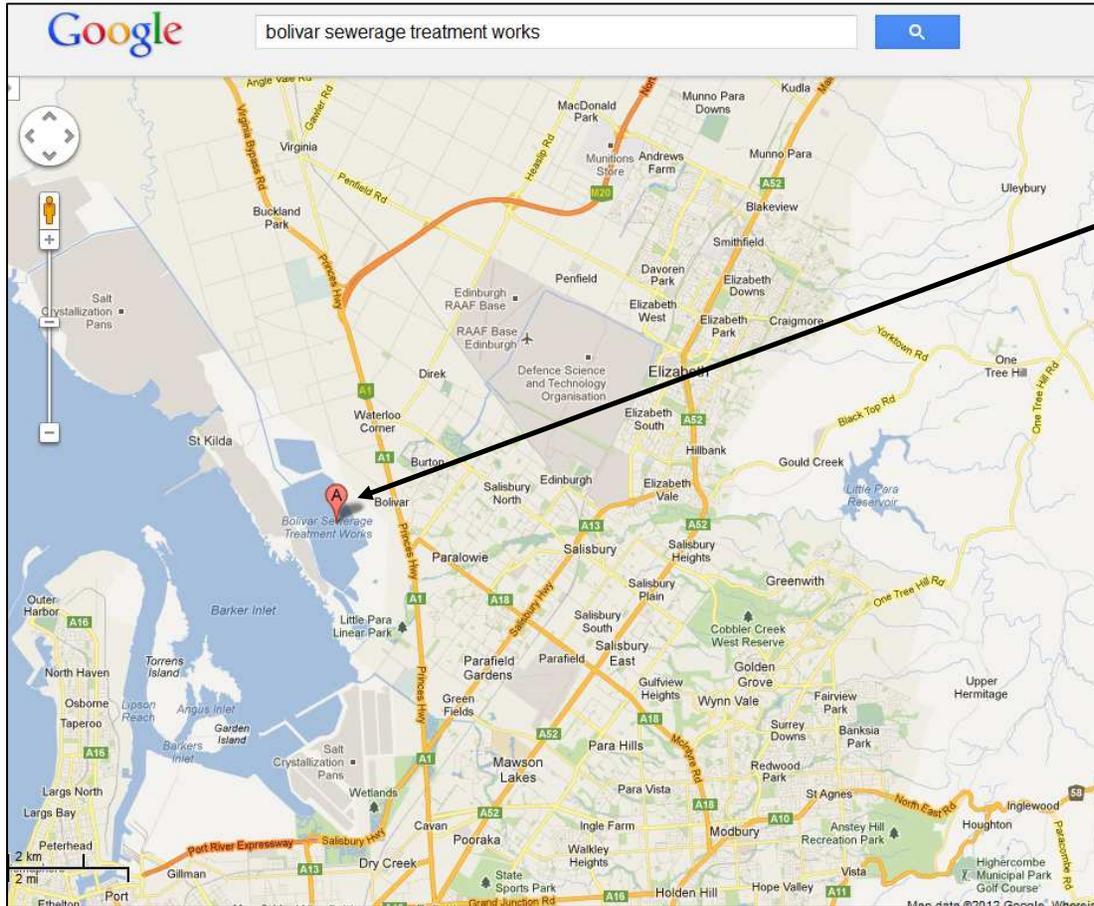
Surveyed		Engineering		Date:		PROJECT MANAGER	
Designed		Approved:				Approval:	
Drawn		MANAGER, ENVIRONMENTAL ASSETS					
Services		Project		Date:			
Plot Date		Approved:					
		GENERAL MANAGER, ENVIRONMENT & LANDSCAPE					

CITY OF TEA TREE GULLY

PROJECT: **IWRMS - DISTRIBUTION MAIN**

ORG. SIZE:	A3
SCALE:	1:20000
SHEET:	2 of 2.
Drawing No.:	654/M/10

APPENDIX G – ACCESS VIRGINIA PIPELINE RECYCLED WATER SCHEME (BOLIVAR WWTP)



Access networks for the Virginia Pipeline Scheme are within a 6km radius of the Bolivar WWTP (approx)

APPENDIX H – WATER PROOFING THE SOUTH RECYCLED WATER SCHEME (Onkaparinga Council)

