HUON VALLEY COUNCIL

ON-SITE WASTE WATER MANAGEMENT SYSTEMS
- INFORMATION PACKAGE -

What is an On-site Waste Water Management System?

The *Building Act 2016* and the *Local Government Act 1993* require that waste water (sewage and sullage) must be collected, treated and disposed of in a manner designed to prevent risk to public health. For those properties that do not have access to sewer infrastructure an on-site waste water system is necessary.

On-site waste water management systems consist of:

1. Waste water treatment unit/system, and
2. Land application system/area.

1. Wastewater Treatment Units/ Systems

Waste water treatment units include:

- septic tanks
- aerated water treatment systems (AWTS)
- sand filters
- grease traps
- composting toilets

The waste water treatment unit treats the initial waste. This can be done at a primary level, as in the case of septic tanks, and involves anaerobic bacteria. Waste water can also be treated to a secondary level, with additional treatment that utilises, for example, aerobic bacteria and chlorine disinfection. Secondary treated waste water is suitable for irrigation.

2. Land Application Systems

A land application system refers to the way primary or secondary treated waste water is delivered to the property. There are different land application systems:

- Trenches
- Beds
- Evapo-transpiration absorption/seepage systems:
- Mound systems
- Irrigation systems

Trenches and beds are the most common type of systems. Generally used on lots that are reasonably flat and where water soaks into the soil readily in all weather conditions. Properly designed absorption trenches can also be used in sloping sections where absorption is good. Perforated pipes, self-supporting arch trenching or box trenching are laid in trenches filled with aggregate or rock. Effluent flows out of the septic tank into the trenches and then soaks into the surrounding soil. The soil and bacteria in the soil treat the effluent further. The most common type of on-site wastewater management system is the conventional septic tank and sub-soil absorption trench. Beds are shallower and generally wider, than trenches.

Evapo-transpiration absorption/seepage systems the effluent is piped through specially constructed beds or trenches incorporating plants. These plants absorb a proportion of the effluent through their root systems and release it to the atmosphere through their leaves during the natural process of transpiration. The ground also absorbs some of the effluent.

Mound systems permit the absorption area to be sited in a location where the natural water table can approach ground level. The mounds are filled with medium-grade sand to provide suitable filtering for treatment of the effluent, before it soaks down into the groundwater table. A pump or siphon-dosing system distributes effluent uniformly through a bed of aggregate placed over the top of the fill. The surfaces of the mound are grassed or planted with shrubs.

Irrigation systems utilise soil absorption and vegetative evapo-transpiration to treat effluent. Irrigation systems can be sub-surface, surface drip, or spray systems.

Other systems: only State Government approved On-site Wastewater Management Systems may be installed. A current list can be found at http://www.wst.tas.gov.au/industries/plumbing/on-site_systems

'PIT AND PUMP' SPRAY SULLAGE SYSTEMS ARE NOT PERMITTED

Under the *Building Act 2016* approval is required to install an on-site waste water management system and the effluent must be treated and disposed of as approved by a Council Environmental Health Officer.

Approval must be obtained before beginning any work associated with the installation of any plumbing, drains, septic tanks or aerobic wastewater treatment systems.

An application seeking approval to install or upgrade an on-site waste water treatment system must be made on the **"Application for Plumbing Permit Form 3"**. A checklist is provided with the application form. This checklist details all the requirements for a successful application. Application fees must be paid when the application form is submitted. Council's Customer Service unit can provide information on the current application fees.

Site and Soil Assessment and Design

Every lot is different and therefore a comprehensive site and soil assessment will be necessary to determine the best type of on-site wastewater management system for your property. A suitably qualified person must carry out the assessment. Once the site and soil evaluation has been completed the suitably qualified person can design the on-site wastewater disposal system. The site and soil assessment and design must be undertaken in accordance with the relevant Australian/New Zealand Standard AS/NZS 1547:2012 On-site domestic wastewater management.

What is a Reserve Area?

The purpose of setting aside a reserve area for future extension of a land-application system is to allow a factor of safety against unforseen malfunction or failure, perhaps following increased household occupancy or inadvertent misuse of the system. Generally speaking, the reserve area should be 100% of the original area. Your system designer should determine what the required reserve area should be and where it should be designated on the property.

PROCESS FOR APPROVAL FOR AN ON-SITE WASTEWATER MANAGEMENT SYSTEM

The process can be broken down into a few steps grouped into three areas:

A. DESIGN & APPLICATION

An onsite waste water system needs to be suitable for the site and for the intended use. Specialists will assess not only your use of water and therefore the waste output, but also factor into consideration the topography of the land, soil quality and weather. There are many systems available and the designers will use lots of information to ascertain the best system for you.

1. **Engage the services of a suitably qualified site and soil evaluator and system designer.**
2. **Make application with Council for a Plumbing Permit and attach the report provided by the system designer.**

B. WORKS

Once you have achieved approval from Council (i.e. received your Plumbing Permit) you can:

3. **Engage the services of a suitably qualified plumber and other professionals as needed.**

C. COMPLETION

Upon completion of all works relating to the Plumbing Permit:

4. **Submit completion of works documentation to Council including Form 71B from the Plumber and certification from the system designer).**

Once all the required documentation has been submitted:

5. **Council issues Certificate of Plumbing Completion for Plumbing works.**

NB: APPROVAL MUST BE OBTAINED FROM COUNCIL PRIOR TO COMMENCING ANY WORKS ASSOCIATED WITH THE INSTALLATION OF ANY PLUMBING, DRAINS, SEPTIC TANKS, AWTS OR SUBSEQUENT WASTE WATER DISPOSAL AREAS.

Documentation

Every step of the process involves documentation. It is the responsibility of the application (which may be the owner or agent) to ensure that the correct documentation is lodged with Council. All applications must be lodged through Council's Customer Service Unit and not with individual departments.

Timeframes

There are timeframes associated with Council permits, including Plumbing Permits. Upon lodgement, in accordance with the *Building Act 2016* Council's Officers have 21 days to assess or reject the application with the exception if the application is incomplete and further information is required. Once approved, Plumbing Permits are valid for 24 months from the date of issue. This means that the works must be completed, including sign off from plumbers and designers, within 24 months from the date of issue. Also, all works must commence within 12 months from the date of issue, and a start work notice must be issued within this timeframe. Should either of these timeframes not be met, the permit will automatically expire.

What does an expired permit mean?

An expired permit means that the permit has lapsed and is no longer valid. Legal implications may arise if works are undertaken when the Plumbing Permit has expired.

Can I get an extension?

You may make application with Council for an extension to your Plumbing Permit. An application form must be completed and fee paid at the time of lodgement.

SEPTIC SYSTEMS

In unsewered areas, the correct treatment and reuse of household wastewater onsite is critical in ensuring minimal impact to public health and the environment. Septic systems have been developed as a way of achieving this.

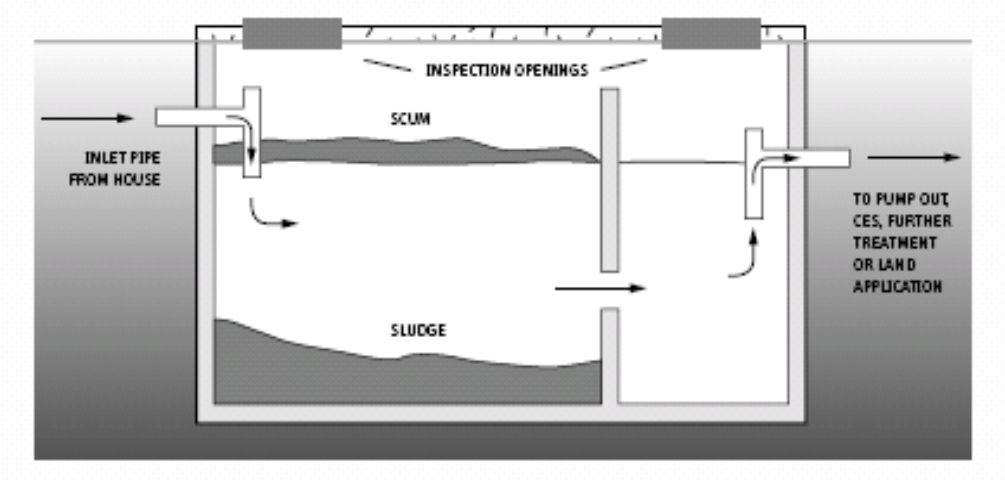
What is a septic system?

A septic system consists of a septic tank combined with a soil absorption system and/or transpiration beds. The system enables people living in unsewered areas to treat and disperse their sewerage.

A septic tank is a structurally sound watertight tank used for the treatment of sewage and liquid wastes from a single household, amenity buildings, shed, etc.

How does a septic system work?

Wastewater from the kitchen, bathrooms and laundry enter the tank. The septic tank allows the solids to settle on the bottom of the tank forming a sludge layer, whilst fats, oils, hair and other 'floatable' materials form a "scum" layer on the surface of the water in the tank. The liquid layer that forms between the scum and sludge overflows and discharges into a trench in the ground, usually called an absorption trench.



Over time, the sludge and scum layers build up and the tank will need to be pumped out. The frequency of pumping is dependent on the level of use, input into the system and climatic conditions however it is generally recommended to occur every 3 years.

What should not be placed in a septic system?

- ☒ Bleach or other disinfectants
- ☒ Sanitary napkins, condoms, nappies or any other foreign materials
- ☒ Large volumes of detergents
- ☒ Fats, oils or food waste
- ☒ Stormwater

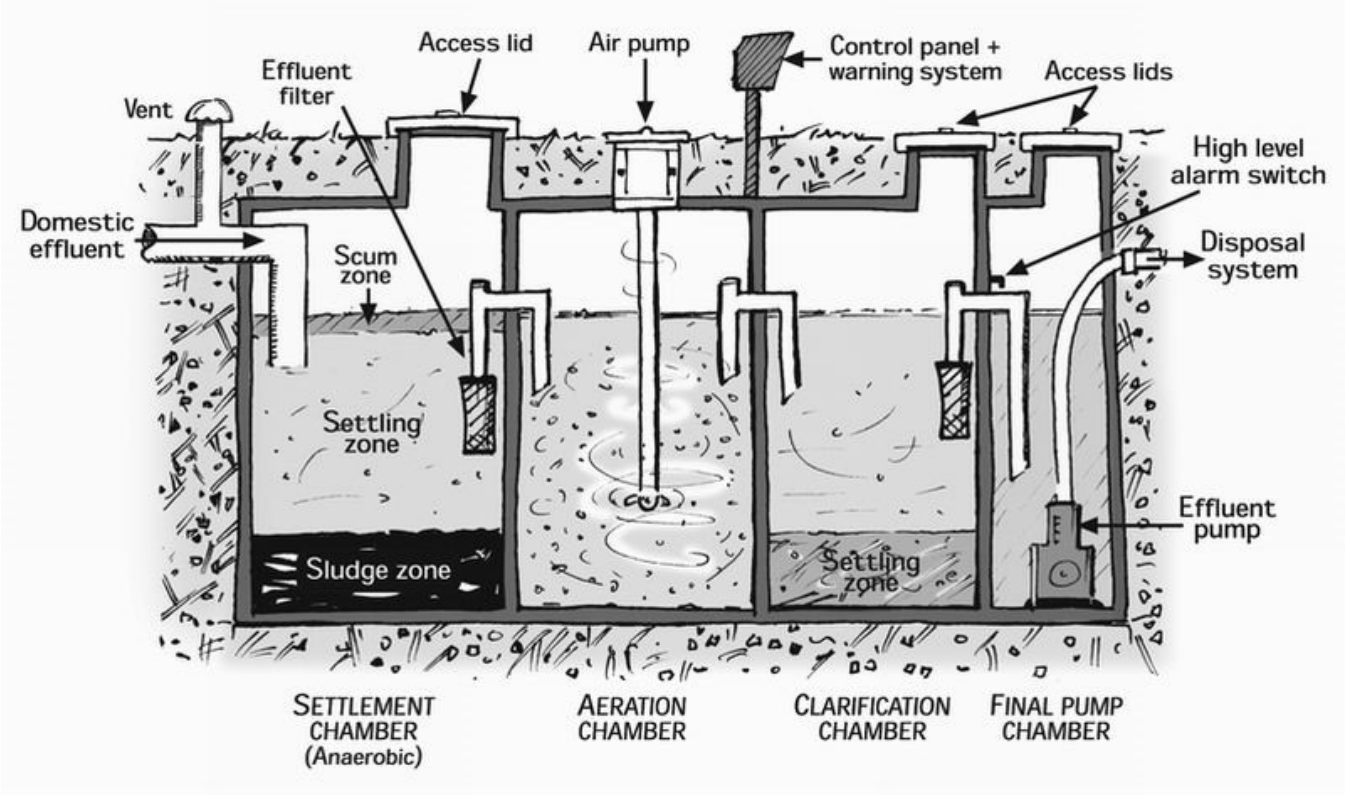
The liquid effluent/wastewater leaving the septic tank contains high levels of bacteria and other organisms that are highly infectious and can cause disease. It is for this reason that the effluent must not be sprayed or allowed to 'pool' on your property, and should be applied to land below the ground surface in an absorption trench/bed.

AERATED WASTEWATER TREATMENT SYSTEMS (AWTS)

An Aerated Wastewater Treatment System (AWTS) is a small scale onsite sewage treatment plant. Through a series of treatment and disinfection processes, household wastewater is transformed into non-potable water that is distributed on lawns and gardens.

How does an AWTS work?

In an AWTS, wastewater is treated in multiple stages through several different chambers within a one or two tank system. Wastewater enters the primary chamber where solids settle to the bottom and form a sludge layer. The scum layer, containing fats and greases, collects at the top of the chamber and the clarified wastewater flows from between the two layers to the aeration chamber. In the second chamber, the wastewater is aerated and broken down further by biological activity. The clarification chamber allows further clarification of the wastewater through the settling of any remaining solids. The treated effluent is finally disinfected in a chlorination or UV chamber and irrigated through fixed hoses across lawns or gardens either above ground or via a subsurface system.



Maintenance Agreement

The owner of a property where an AWTS is installed must maintain a current service agreement with a person who is qualified and accredited to service and maintain AWTS.

AWTS must, by law, be serviced on a quarterly basis and a fee is payable for this service. The service agent sets the fee and what is covered by the agreement.

Owner Maintenance

In addition to the maintenance agreement, the owner is required to effectively maintain the disposal area. Generally accepted methods of disposal are:

- Surface irrigation: consists of sprays or drippers located around mulched or barked areas planted out with suitable vegetation that will tolerate wet and high salt conditions. Owner maintenance of these areas will consist of regular weeding, replacement of plants as necessary and maintaining a 150mm minimum depth of mulch or bark.
- Subsurface irrigation: consists of special piping that is installed approximately 150mm under the ground and can be used to water garden beds or grassed areas. If grassed areas are used then maintenance entails mowing of the grass.
- A combination of surface and sub-surface irrigation areas may be used but they will need to be tapped to allow for the different pressure requirements of the system components.

The owner is required to maintain a minimum area for irrigation, as conditioned in the Special Plumbing Permit.

It is recommended that the AWTS be operated continuously and avoid turning off the power to the system.

Suitable signage must be displayed around the disposal area, i.e. “Recycled Water, Avoid Contact, Do Not Drink”.

Do’s & Don’ts to maintaining a healthy AWTS

There are a number of things you can do to maintain a healthy OWWMS.

Avoid or minimise use of cleaning agents, detergents, degreasers, photographic chemicals, cosmetics, lotions, pesticides and herbicides. Even small amounts of these chemicals can upset chemical and biological activity within the system.

Do not place disposable nappies, tissues, sanitary napkins, tampons, paper towels, plastics, cigarette butts, bones and coffee grinds into the system. These materials can potentially overload the system or cause pump failure.

Do not use the treated water to water vegetable gardens, fill swimming pools or for any other domestic purpose.

Do not turn off the power to your AWTS.

Do not put fats and oils down drains and sinks.

Do practice water conservation to avoid overloading the system.

Do ensure that the system receives servicing following the specified regime.

Do monitor your system for signs of ill-health including: unusual or foul odours, leaks or overflow from the tank, pooling of wastes or liquid in and around the disposal area. Contact your service technician if you think there is a problem with your system.

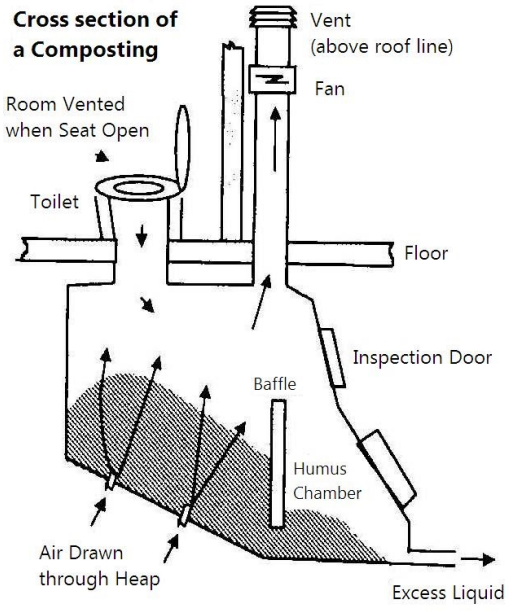
Do use products that are labelled as biodegradable or septic-safe.

Do use alternative cleaning products such as bicarbonate of soda, pure soap, borax, vinegar, lemon juice, cloudy ammonia, etc.

OTHER SYSTEMS

Waterless Composting Toilets

Waterless composting toilets are designed to receive human excreta, urine and organic household kitchen scraps and rely on the principle of composting by microorganisms. Systems are either continuous or batch. Continuous systems contain one chamber, whilst batch systems contain several bins, with rotation occurring after each bin is filled. In both systems, chambers or bins are installed below floor level. Waterless composting toilets do not treat wastewater from other sources such as showers, sinks, and washing machines (also known as 'greywater'), so an alternative system is required for this.



There are several types of waterless composting toilet available, but the principles they use are basically the same. Excreta (both urine and faeces) is collected in a sealed chamber beneath the toilet pedestal. Extra organic matter such as woodshavings, paper, or lawn clippings are added to create and ideal composting environment. Microorganisms decompose the material, with around three quarters of it being converted to carbon dioxide and water vapour. Air drawn through the pile removes these gases and assists the microorganisms.

The remaining material slowly moves down a sloping floor by gravity as more material is added to the pile. It then moves under a dividing baffle into the humus chamber as friable compost after about a year.

Any excess liquids are drained and treated with the greywater. The compost produced is buried on-site.

The advantage of composting toilets is that they can be used on difficult sites as they do not require water. National Parks and low usage camping areas with limited water supplies are common sites. They can also be used in single domestic premises and may be installed externally or within the dwelling.

Wet Composting Toilets

Wet composting toilets function in a similar manner to a waterless composting toilet. However, unlike dry composting toilets, wet composting systems can be used in conjunction with flushing toilets, and all liquid deposited into the system filters through the solid matter within the chamber. Extra organic material such as food waste residues, paper or vegetable scraps can be added to improve the decomposition process. Worms and bacteria work to break down the solids in a similar manner to the dry composting toilets, and compost is removed from the base of the pile via a separate chute.

Filtered wastewater is collected at the bottom of the tank and either pumped or gravity fed to a land application area.

Incinerating/Combustion Toilets

Incinerating toilets treat human excreta by combustion. A metal pan is lined with paper upon which the excreta is deposited. Once the lid of the toilet closes it locks until incineration is complete. The toilet is operated from LPG and an auto ignition device to direct a flame to incinerate the waste. After the incineration has completed the toilet lid can not be opened until the pan has cooled.

The system has the advantage that it does not produce a liquid effluent. The incineration of waste may produce odour and it is suited only to remote areas.

Displacement Toilets

The one type of displacement toilet currently available is known as a hybrid toilet. The system consists of a non-flushing drop toilet situated above a septic tank type device filled with water that overflows into a second compartment. As waste enters the tank it displaces an equivalent volume of effluent. Because the toilet is non-flushing the volume of effluent produced is minimal. No water seal exists, therefore the chamber must be vented to prevent odours.

The detention time of wastewater in the treatment unit is substantial and this acts to improve microbiological quality, BOD_5 and suspended solids. The effluent must be discharged into a soil absorption system or may be discharged into a holding pit for off site removal. These systems are low maintenance and are suitable for problem sites where other treatment systems are not suitable. Obviously they only treat toilet waste and if installed in a house, greywater must be managed separately.

Constructed Wetlands – Reed Beds

Constructed wetlands and reed beds are purpose-built areas where the water surface is near ground level for enough of the year to maintain saturated soil conditions and promote growth of vegetation. Constructed wetlands may be used further to treat wastewater that has undergone secondary treatment (such as an AWTS) before land application.

Wetlands can be effective sediment traps and good sites for the breakdown of organic material. Their performance in removing nutrients is less predictable. Long-term removal of nitrogen is possible in some cases, but phosphorus removal is unreliable. Under some conditions these systems can even release nutrients to the wastewater. The parameters that enhance wetland performance and system reliability are currently not well known, and there are no generally accepted design criteria for constructed wetlands.

Sand Mounds – Sand Filters

Sand mounds and filters can be used to further treat wastewater that has undergone primary or secondary treatment (such as through a septic tank or AWTS) before land application. They use a combination of biological processes and adsorption to achieve high removal efficiencies for biochemical oxygen demand (BOD), suspended solids (SS), nutrients and pathogens.

There are many different systems that will adequately treat wastewater. Your system designer will recommend suitable options based on the site & soil evaluation undertaken on your property.

CURRENT ACCREDITED SITE & SOIL EVALUATORS AND SYSTEM DESIGNERS

COMPANY	ADDRESS	PHONE/EMAIL
Aldanmark Pty Ltd	Level 9/65 Murray Street HOBART TAS 7000	03 6234 8666 mail@aldanmark.com.au
Chris Potter Engineering	9 Warwick Street HOBART TAS 7000	03 6231 4143 0407 794 292 potteng@iinet.net.au
William C Cromer Pty Ltd	74a Channel Highway TAROONA TAS 7054	0408 122 127 billcromer@bigpond.com
ENHealth Consulting (Richard Mason)	20 Adelong Drive KINGSTON TAS 7050	03 6229 1651 0418 589 309 richardmason@iprimus.com.au
GEO-Environmental Solutions (John Paul Cumming)	86 Queen Street SANDY BAY TAS 7005	03 6223 1839 0413 541 531 jcumming@geosolutions.net.au
Joe Mamic & Associates	421 Elizabeth Street NORTH HOBART TAS 7002	03 6231 4422 jmamic@trump.net.au
Johnstone, McGee & Gandy	117 Harrington Street HOBART TAS 7000	03 6231 2555 contact.hbt@jmg.net.au
Onsite Waste Water Solutions (John Parkinson)	Cambridge	0409 336 306 murraypark1@bigpond.com
Pitt & Sherry	199 Macquarie Street HOBART TAS 7000	03 6210 1400 info@pittsh.com.au
RJK Consulting Engineers (Risden Knightley)	PO Box 128 PROSPECT TAS 7250	0400 642 469 rjkmail@netspace.net.au
Rock Solid Geotechnics (Peter Hofto)	171 Scenic Drive LEWISHAM TAS 7173	0417 960 769 phofto@bigpond.net.au
SEAM	160 New Town Road NEW TOWN TAS 7008	03 6228 1600 admin@seam.com.au
Strata Geoscience & Environmental (Sven Nielsen)	17 Little Arthur Street NORTH HOBART TAS 7000	0413 545 358 sven@strataconsulting.com.au
Hobart Building Assessment Services (Mike Westcott)	583 Nelson Road MOUNT NELSON TAS 7007	0407 796 978 mike@hobartbuildingassessmentservices.com.au

DISCLAIMER

Huon Valley Council does not endorse nor recommend any person/company included on the above list. The information is provided to assist developers to identify those having previous experience with the preparation of site and soil evaluation reports and the design of onsite waste water systems. Others not included on this list having appropriate skills and knowledge may also submit reports.

PLANTS SUITABLE FOR ABSORPTION AREAS

BOTANICAL NAME	COMMON NAME
TREES	
Melaleuca ericfolia	Swamp Paper Bark
Melaleuca styphelioides	Prickly Paper Bark
Melaleuca armillaria	Bracelet Honey Myrtle
Melaleuca linanfolia	Flax Leaf Paper Myrtle
Eucalyptus ovata	Black Gum
SHRUBS	
Callistemon viminalis	Bottlebrush
Callistemon pallidus	Bottlebrush
Leptospermum laevigatum	Coastal Tea-Tree
Leptospermum lanigerum	Woolly Tea-Tree
Melaleuca thymifolia	Thyme Leaf Myrtle
Melaleuca gibossa	Small Leafed Paperbark
Vimanana juncea	Native Broom
GROUND COVERS	
Leptospermum horizontalis	Ground Cover Tea-Trees
Juncus pallidus	Native Rush
Correa mannii	Correa native fuschia
Correa Dusty Bells	Correa native fuschia
Restio tetraphyllus	Long Leafed Tassel Rush