



# ON SITE WASTEWATER POLICY INVESTIGATION

May 2013

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# 1 Introduction

Council's wastewater policy has largely been driven by the need to protect the Mt Gambier's potable water supply that is sourced from the Blue Lake.

The connection between the surface water recharge of the groundwater system that supplies potable water to Mt Gambier is well established, and capture and buffer zones have been created to protect the groundwater system. This ensures that the risk of pollution to stormwater and surface waters in the recharge protection zones is minimised.

Council's current development policy to manage onsite wastewater for new development is that only Aerobic On-site Wastewater Treatment Systems (AWTS) are approved in areas where mains sewer is not available. The majority of wastewater discharge in Mt Gambier is served by a reticulated sewer network by SA Water. It is understood that there are a number of existing septic systems in sewered areas that are currently not connected to the main.

Council is responsible for assessing the application for new domestic onsite wastewater systems and conducts site inspections at the time of installation. As part of the development process an application to install an AWTS needs to be lodged with, and approved by Council.

There is growing evidence that AWTS units, if not properly serviced and maintained, fall short of required SA Health and EPA performance standards, and become a potential public health risk, and a risk to the environment. There is evidence, especially for older systems, where AWTS' have been found to be in various states of deterioration and in some cases, discharging primary effluent directly to the environment. Because the means of disposal is mostly by surface irrigation, the cumulative effect of older and poor performing wastewater systems on surface water runoff and groundwater systems is of increasing concern.

## 1.1 Aim of the Review

This report has been commissioned by Council to undertake the following:

- a) Review the existing wastewater management policy and provide advice on the appropriateness of it;
- b) Provide advice on the parameters that the policy should be based upon and what approach should be taken when considering the appropriateness of systems for the area's unique environment;
- c) Provide recommendations on what wastewater management systems are appropriate for the region, including indicative costings of each system, and the characteristics of each system (the project brief specified that appropriate onsite systems identified should also give regard to the complexity of the systems, and the limited number of plumbers in the region with onsite wastewater management expertise); and
- d) Develop a matrix based on geographic location and soil characteristics to identify appropriate systems.

## 1.2 Methodology

The following methodology has been used to prepare this report in response to the project brief:

- A desktop review of Council's current policies relevant to onsite wastewater management and current state and national policy relevant to this matter;

- Preparation of soil mapping information and identification of relevant local bio-physical issues that impact on onsite wastewater management, including:
  - A high level assessment of local soil drainage characteristics using Australian Soil Resource Information System (ASRIS) mapping, available Surface Soil Borelogs (not available from Council at the time of this investigation), and GIS soil maps, to assist with the selection of appropriate land application systems;
  - Using available data to identify other limiting conditions such as location of watercourses, depth to groundwater, and proximity to water supply and drainage bores;
  - Preparation of a water balance for a typical domestic aerated wastewater treatment system (AWTS) in the area;
- Identification of the location of existing onsite wastewater management systems and preparation of mapping information;
- Identification of contemporary onsite wastewater management systems that may be appropriate for use in the area and meet criteria based on the AS/NZ 1547:2012 Onsite Domestic Wastewater Management, and SA Health - Onsite Wastewater Systems Code 2012;
- Preparation of recommended amendments to policy;
- Preparation of a decision making matrix with supporting mapping information, and indicative costing to assist Council in determining the appropriate use of systems in unsewered areas of the city; and
- Identification of follow up actions.



## 2 Policy context for onsite wastewater management

The following legislation provides the framework and guidelines for management of onsite wastewater systems and Community Wastewater Management Systems (CWMS). Note that Mount Gambier do not currently operate a CWMS.

### 2.1.1 South Australian Public Health Act 2011

The South Australian Public Health Act 2011 (SAPH Act), previously the Public and Environmental Health Act 1987, is the legislation under which the Public and Environmental Health (Waste Control) Regulations 2010 and SA Health Onsite Wastewater Systems Code 2012 is administered. As part of the implementation of the SAPH Act the Waste Control Regulations (and associated Prescribed Codes) have been revised and updated and are currently being enacted. The changes to the Waste Control Regulations are summarised in the following section 2.1.42. Mount Gambier Council manages onsite wastewater systems under this legislative framework, including regulations which allow Council to manage approvals, and enforcement requirements.

### 2.1.2 South Australian Public Health (Wastewater) Regulations 2013

The Regulations provide the framework for administration of domestic wastewater controls, including: onsite wastewater treatment and disposal; connections to CWMS; and product and installation approvals.

Development of the revised Regulations and their accompanying Prescribed Codes was prompted by the continuing need to manage public health risks through properly regulated wastewater systems.

While much of the regulatory process of product and installation approvals for wastewater systems remains unchanged, the revised regulations will require Council (and the industry), to adopt a number of significant changes, summarised as follows:

- Adoption of Australian and New Zealand standards, for onsite wastewater systems including product and installation compliance;
- Modification of the product approval process carried out by the Department for Health to assist Councils in installation approval of all domestic onsite wastewater systems;
- Adoption of Certificates of Compliances (COC's) for all work carried out by suitably qualified persons when installing wastewater systems as well as expanding the work covered by these certificates to include installation of onsite systems;
- A requirement for all sites to be assessed by a wastewater engineer as part of an application to install an onsite system; and
- A requirement for all wastewater service technicians to undertake training.

It is worth noting that COC's are required to be issued at the final completion of the installation of a wastewater system, which includes the completion of testing and commissioning of the subsurface disposal systems, and irrigation systems (in the case of AWTS). In the past, the disposal system, usually for surface irrigation systems, was often left to the owner to install (when gardens and landscaping were prepared). This work will now be integral in the overall certification process. The implementation of a compliance system (COC's), will require additional council resources initially to establish the procedure, for follow up inspection, monitoring, and enforcement, and ongoing education of installers and certifiers, to successfully administer the new requirements.

### 2.1.3 Environmental Protection (Water Quality) Policy (2003)

Water quality in South Australia is protected by the Environmental Protection Act (1993), and the environmental protection policies made under it. In particular the Environmental Protection (Water Quality) Policy (WQ EPP 2003) provides the structure for protection of surface and groundwater sources. It regulates activities such as the management of stormwater, wastewater treatment, storage, and land and marine based application of wastewater. Currently wastewater treatment and disposal systems are required to be approved by the EPA for systems over 50EP in size.

The current WQ EPP 2003 is currently being amended, and proposed changes to the policy will have an impact on the statutory requirements for discharge from septic and sewerage treatment systems. The net effect of the changes will be a reduction of mandatory compliance criteria, in favour of meeting more general environmental objectives.

The changes to environmental policy will impact Councils current approach with regard to approval of septic systems, in so far as performance criteria required for aerated wastewater systems for example, may not be sufficient or necessarily guaranteed as an indicator for environmental performance.

### 2.1.4 Codes of Practice and Standards

The following are the regulations prescribed codes for the application of onsite wastewater management.

#### ***SA Health Onsite Wastewater Systems Code 2013***

The SA Health Onsite Wastewater Systems Code 2013 is both an update of the previous 2009 version, and also replaces the *South Australian Health Commission Code Waste Control Systems—Standard For The Construction, Installation and Operation of Septic Tank Systems in South Australia*, including *Supplement A - Aerobic Sand Filters* and *Supplement B - Aerobic Wastewater Treatment Systems*. The code provides information on the requirements for:

- Planning stages of onsite wastewater systems;
- Design of onsite wastewater systems;
- Technical aspects of Community Wastewater Management Systems (CWMS); and
- Approvals for onsite wastewater products;
- The responsibility that Councils have for approvals for the following wastewater applications:
  - Onsite Wastewater systems (40EP or less);
  - Permanent Greywater systems; and
  - Connections to CWMS and Trade Waste connections.

#### ***Australian Standard AS/NZ1547:2012***

AS/NZ 1547:2012 provides information with respect to design and selection of appropriate onsite disposal systems that suit the specific conditions, including soil, climate, and the groundwater table. It is recognised by SA Health as an approved best practice approach for the design, construction, and installation of land application systems.

#### ***Australian Standard AS 3500 - National Plumbing and Drainage Code***

In particular AS 3500.0—1990 (Glossary of Terms), AS 3500.1—1992 (Water Supply), Sections 8 and 9, and AS 3500.2—1990 (Sanitary Plumbing and Sanitary Drainage), provides the method for the

licenced installation of plumbing drainage, water supply, and plumbing systems, including domestic and commercial onsite wastewater disposal.

### 2.1.5 Local policy

It is understood from the information provided by Council that local policy relevant to onsite wastewater management is set in the local Mount Gambier Development Plan. Section 6 provides an overview of the current clauses and recommended changes.

#### ***Blue Lake Management Plan 2006***

The purpose of the Blue Lake Management Plan is to provide strategic direction and a work plan for the management of the Blue Lake and surrounding areas, and is reviewed 5 yearly. The goal of the plan is: "Enhancement and protection of the Blue Lake and aquifer system as a long term water resource asset to the Mount Gambier and district community".

In order to protect the aquifer system, management zones were introduced to help control the quality of water entering the aquifer system, particularly stormwater. They are the Protection Zone and the Capture and Buffer Zone. In essence the zones identify the area where the surface groundwater interface is most connected, and where contamination of groundwater is at greatest risk.

It may be prudent for Council to consider the appropriateness or otherwise of the next review of the BLMP having regard to the need to exclude onsite wastewater management from specified zones, as recommended in this study.

## 3 Factors affecting the location and operation of onsite wastewater management systems

### 3.1 Rainfall

Rainfall in Mt Gambier is critical for the replenishment of potable water sources for the township. In addition average rainfall and climatic conditions determine the design capacity for onsite wastewater systems. A water balance is an important tool for calculating the capacity for the soil to hold and treat wastewater, and evapo-transpiration of surface application systems. The following Figure 3-1 indicates the average monthly rainfall and mean daily evaporation in Mt Gambier.

Mt Gambier has an average annual rainfall of approximately 750mm, and an average annual evaporation of 1280mm. Historical climate data was sourced from: BOM Station 026021 Mt Gambier Aero.

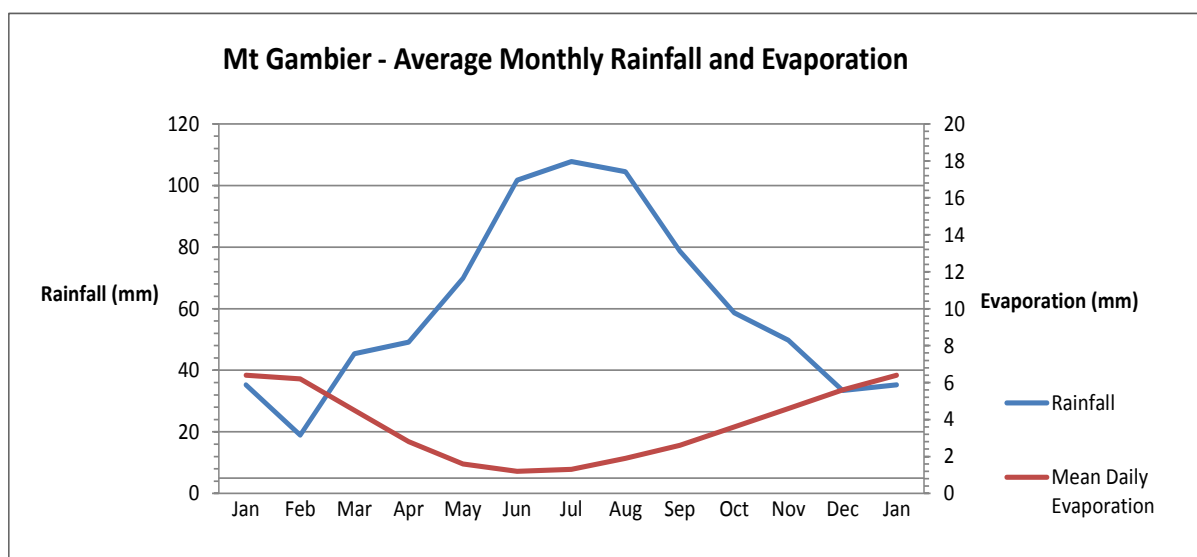


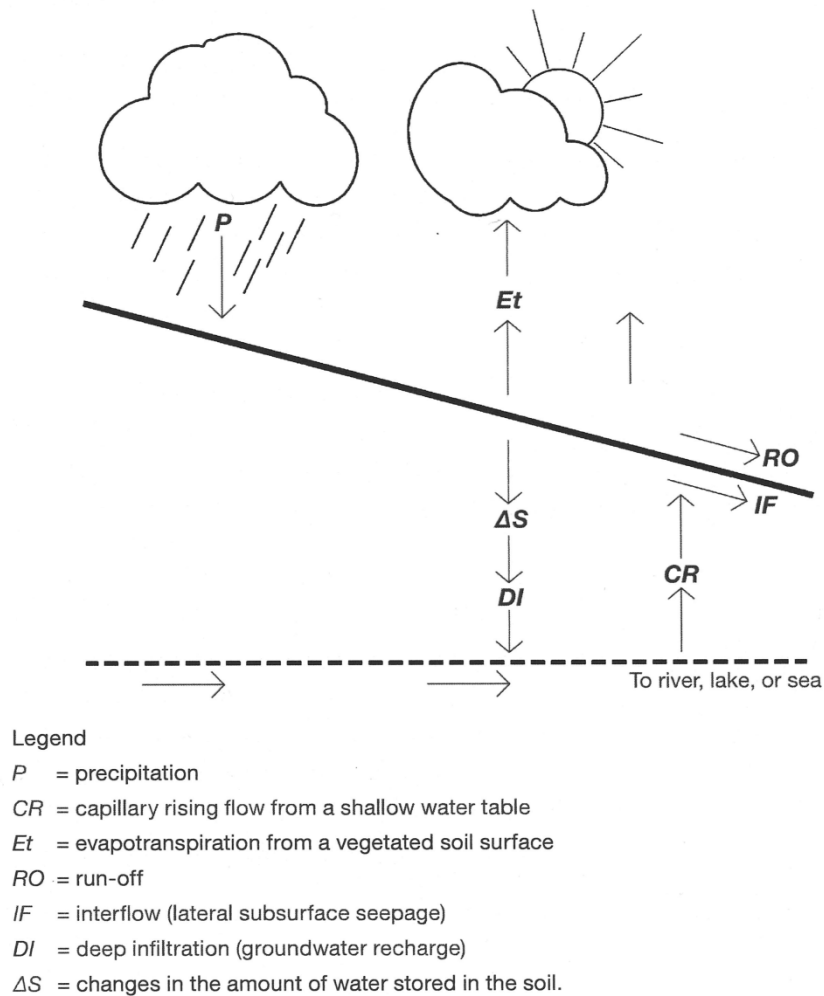
FIGURE 3-1 RAINFALL AND EVAPORATION IN MOUNT GAMBIER

### 3.2 Water Balance

Water balance calculations should be considered for determining suitable types of land application systems for wastewater disposal. The mechanism for the natural water balance cycle is indicated in Figure 3-2. The method for calculation of water balance is outlined in AS1547:2012. The relationship between the natural water cycle and the addition of a wastewater component is described by the formula (with reference to the legend in Figure 3-2):

$$P + \text{EFFLUENT} = E_t + \text{RO} + \text{IF} + \text{DI} + \Delta S$$

Effectively this can be described as 'the total contributing inflow = total contributing outflow'.



**FIGURE 3-2 WATER BALANCE CYCLE**

Source: AS1547:2012

### 3.2.1 Water balance scenario

A water balance scenario has been developed for a typical domestic household discharging secondary treated wastewater to surface irrigation in Mt Gambier. The purpose for doing this is to better understand the limitations of surface irrigated disposal of wastewater, and highlight the importance of water balance calculations in determining factors such as disposal area size when considering AWTS applications.

The typical parameters used to determine the water balance are as follows:

- A crop transpiration coefficient of 0.875, (values range from 0 to 1 where 1 is most conservative);
- Average rainfall and evaporation rates as per Figure 3-1;
- Irrigation rates based on wastewater inflows of 150L/person/day (or 900L/day/dwelling);
- Design Irrigation Rate (DIR) of 35mm/m<sup>2</sup>/week, which accords to a maximum allowable in free draining sands; and
- Wastewater application over an irrigated area of 200m<sup>2</sup>.

The water balance calculation and wastewater component of the water balance is provided in the following Table 3-1.

TABLE 3-1 WASTEWATER WATER BALANCE

Month	No. of days	Inputs				Outputs				Balance	
		Avg Rainfall (mm)	Wastewater inflow in mm/month (based on 900L/day)	Total inflow (wastewater + rainfall)	Wastewater component as a % of total input	Mean Evaporation Eto (mm)	Corrected Eto to include crop transpiration factor Etc (mm)	Total Application Evaporated (mm)	Wastewater evaporated (mm)	Total Infiltration (mm)	Wastewater component of infiltration (mm)
Jan	31	27	140	167	84%	224	196.0	167	140	0	0
Feb	28.25	26	127	153	83%	191	167.1	153	127	0	0
Mar	31	35	140	175	80%	158	138.3	138	110	37	29
Apr	30	55	135	190	71%	101	88.4	88	63	101	72
May	31	70	140	210	67%	64	56.0	56	37	154	102
Jun	30	84	135	219	62%	43	37.6	38	23	181	112
Jul	31	99	140	239	58%	52	45.5	46	27	193	113
Aug	31	95	140	235	59%	72	63.0	63	37	172	102
Sep	30	73	135	208	65%	100	87.5	88	57	120	78
Oct	31	61	140	201	70%	142	124.3	124	86	76	53
Nov	30	47	135	182	74%	176	154.0	154	114	28	21
Dec	31	39	140	178	78%	196	171.5	172	134	7	5

### Discussion

The balance output indicates that maximum infiltration occurs in July (193mm), and evaporation exceeds infiltration on average, in the months of January and February.

As the volume of wastewater is distributed it collects in the surface soil layers. The greater the surface area over which the wastewater is broadcast, the less build-up in the soil. Depending on the infiltration rate of the surface soil horizon, the area of distribution will determine whether wastewater will be stored in the soil, and the volume of wastewater stored. Essentially this is a monthly calculation of the net excess of inflow over outflow at the end of an average climate year.

Using a conservative approach in Mount Gambier, it is assumed that a high infiltration rate is typically present in sandy surface soils (35mm/m<sup>2</sup>/week in the water balance scenario), and in order to minimise the potential for contamination of groundwater, the area over which wastewater is applied should be at least large enough to minimise storage in the surface soil. This is achieved in the water balance scenario by increasing the application of wastewater over an irrigated area of 280 m<sup>2</sup>.

This is illustrated in Figure 3-3 where the level of infiltration of wastewater decreases as the disposal area increases. The 200 m<sup>2</sup> footprint represents the current minimum standard, and 400m<sup>2</sup> has been included to indicate the effect of a larger footprint, and potentially a more conservative approach to surface disposal than may be considered appropriate for similar soil conditions in Mount Gambier.

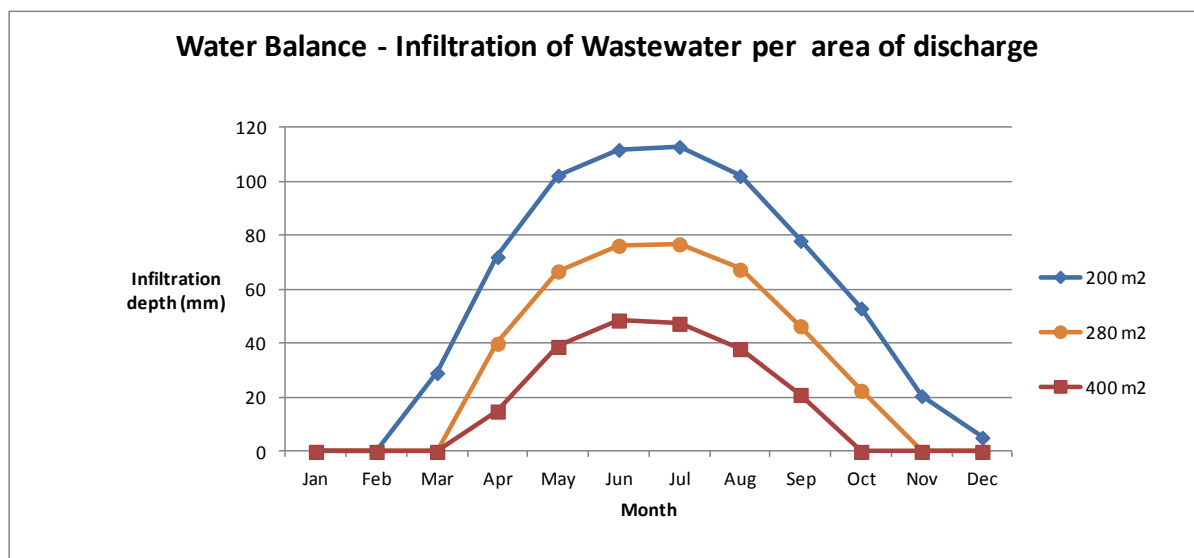


FIGURE 3-3 WASTEWATER INFILTRATION OVER VARYING AREAS

### 3.3 Soil characteristics

Onsite wastewater treatment systems are used where connection to the sewerage network is not available and their efficiency varies according to the nature of the soil. The effluent should be disposed of within the boundaries of the allotment; therefore the size of an allotment in a septic tank area is governed by the pervious nature of the soil. A site and soil assessment of the capacity for dispersal of wastewater on site is critical for every wastewater application.

For the purposes of this investigation, soil mapping of Mount Gambier and surrounding areas has been undertaken using the Australian Soil Resource Information System (ASRIS) to assess the surface soil characteristics in terms of soil texture, sand and clay content. A spatial representation of surface soil texture is provided in Figure 3-4.

The purpose is to provide a high level assessment that would assist with understanding the limitations of land application systems, and identify suitable wastewater disposal systems for the region, and provide some policy direction. It is not a replacement for a detailed investigation of each individual site, or site conditions, including depth to groundwater. Furthermore, there are many physical and chemical characteristics of soil that determine its treatment capacity; the consideration of soil texture has been used as an indication of permeability.

In accordance with Standard *AS/NZ1547:2012 On-site Domestic Wastewater Management*, soil types are categorised according to their capacity to permeate wastewater and to determine the most appropriate land application disposal system for domestic wastewater. Treated domestic wastewater is further classified as either primary treated sewage (septic tank effluent), or secondary treated sewerage (advanced treatment, such as an Aerated Wastewater Treatment System).

**It would be recommended that Council adopt a minimum area for surface disposal of wastewater when assessing applications for AWTS.**

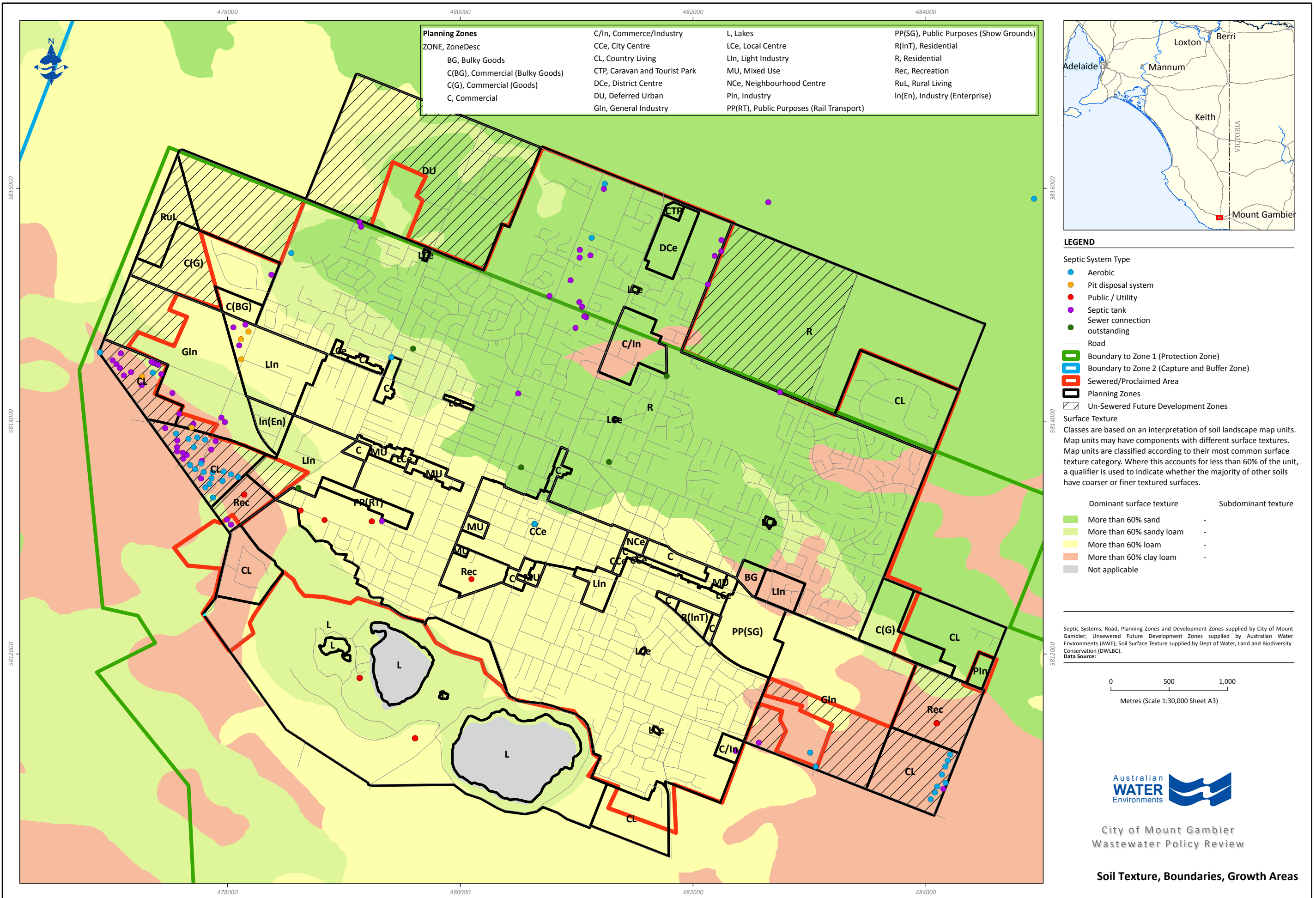
A table of suitable land application systems that is considered appropriate for various soil types is provided in Table 3-2.

TABLE 3-2 SOIL CATEGORIES AND SUITABLE SUBSURFACE LAND APPLICATION SYSTEMS

Soil Category	Soil texture	Soil structure	Permeability (mm/day)	Recommended Land Application Systems	Notes
1	Gravels and Sands	Structureless (massive)	>3000	Shallow subsurface drip irrigation (SSI), Mounds, Wick Trenches	Secondary treatment is required where there is a risk of groundwater contamination.  Absorption Trenches should not be used in Cat.1-3 soils
2	Sandy loams	Weakly structured	> 3000	Mounds, Wick, SSI	
		Massive	1400 – 3000	Mounds, SSI Low Pressure Effluent Distribution (LPED),	
3	Loams	High/moderate structured	1500 – 3000	Evapo-transpiration Absorption (ETA) Mounds, LPED, SSI	
		Weakly structured or massive	500 – 1500	ETA, Absorption trenches, LPED, Mounds, SSI	
4	Clay loams	High/moderate structured	500 – 1500	ETA, Absorption trenches, LPED Mounds, SSI	
		Weakly structured	120 – 500	ETA, Absorption trenches, LPED, SSI	
		Massive	60-120	ETA, Absorption trenches, LPED, SSI	
5	Light clays	Strongly structured	120-500	Absorption trenches, SSI, LPED (with modified topsoil)  Evapo-transpiration Absorption (ETA)	
		Moderately structured	60-120	LPED (with modified topsoil) , SSI, Surface drip/spray irrigation	
		Weakly structured or massive	<60	SSI, Surface drip/spray irrigation	Secondary treatment is recommended in Cat5/6 soils where a primary treatment system cannot be designed to fit land conditions
6	Medium to heavy clays	Strongly structured	60-500	Surface drip/spray irrigation, SSI	
		Moderately structured	<60	Surface drip/spray irrigation, SSI	
		Weakly structured or massive	<60	Surface drip/spray irrigation, SSI	

Note: Soil categories per AS1547:2012





## 4 Onsite wastewater management systems suitable for the region

The following disposal systems may be suitable for Mount Gambier and surrounding areas. Essentially, they are land application systems that have been determined as suitable for installation in sandy soils and sandy loams, as identified in section 3.

It is important to note that the final selection of the disposal system is determined following consideration of a number of interrelated factors apart from soil and site conditions. These include such things as depth to groundwater, terrain and surface runoff, proximity to water supply bores, and the geology and existence of karst formations. A thorough study of site and soil conditions will always need to precede the selection of the wastewater disposal system.

In addition, each of the land application methods proposed can dispose either primary effluent or secondary treated effluent. In either case this would need to be established in the initial assessment, and would be based on the sensitivity of the location, and the capacity of the receiving soils to retain and treat the effluent discharge. A brief description of each system and indicative cost for their installation is provided, as follows.

### 4.1 Pressure Dosed Distribution Bed

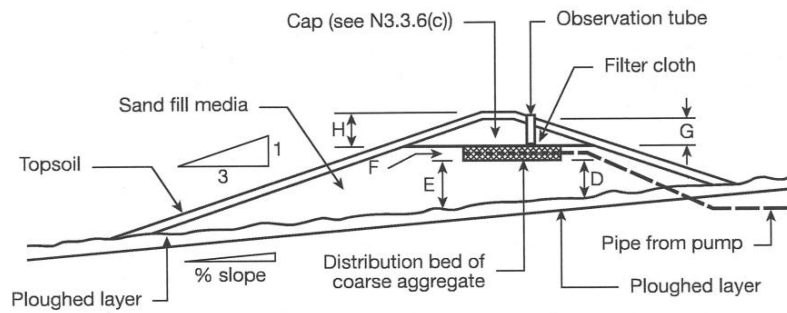


FIGURE 4-1 PRESSURE DOSED DISTRIBUTION BED (SOURCE: AWE – 2012)

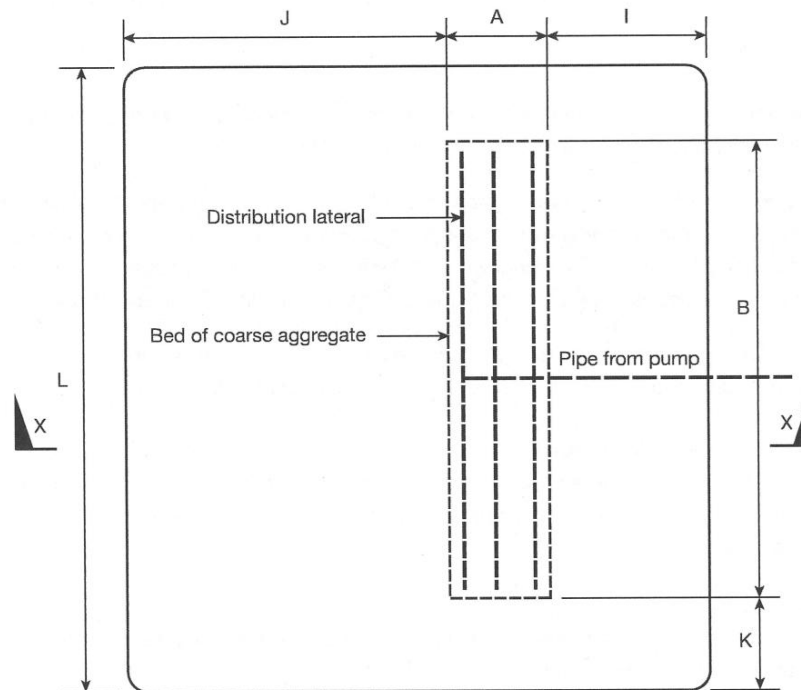
#### **Key features**

- Is suitable for installation in Category 1-3 soils;
- Advanced aeration and retention capability allows longer time for nutrient uptake;
- Typical engineered dispersal solution developed by AWE; and
- Indicative cost to install for standard 6 person system: \$10,000

## 4.2 Mounds



CROSS SECTION VIEW OF MOUND ON SLOPING LAND



PLAN VIEW OF DISTRIBUTION BED

**LEGEND**

Typical dimensions:

A	1200 to 2000 mm	H	450 mm
B	6 to 8 times A	I	Determined by ground slope and 1 in 3 mound face slope
D	600 mm	J	2000 mm minimum on sloping ground (equals I on flat ground)
E	600 mm on flat ground, > 600 mm on sloping ground	K	Determined by height of finished mound and 1 in 3 mound face slope
F	225 mm	L	B + 2K
G	300 mm		

**FIGURE 4-2 DISPOSAL MOUND (SOURCE: AS1547:2012)**

**Key features**

- Is suitable for installation in all soil categories, and shallow soils;
- Suitable where high seasonal groundwater is present; and
- Indicative cost to install for standard 6 person system: \$15,000

### 4.3 Surface Irrigation

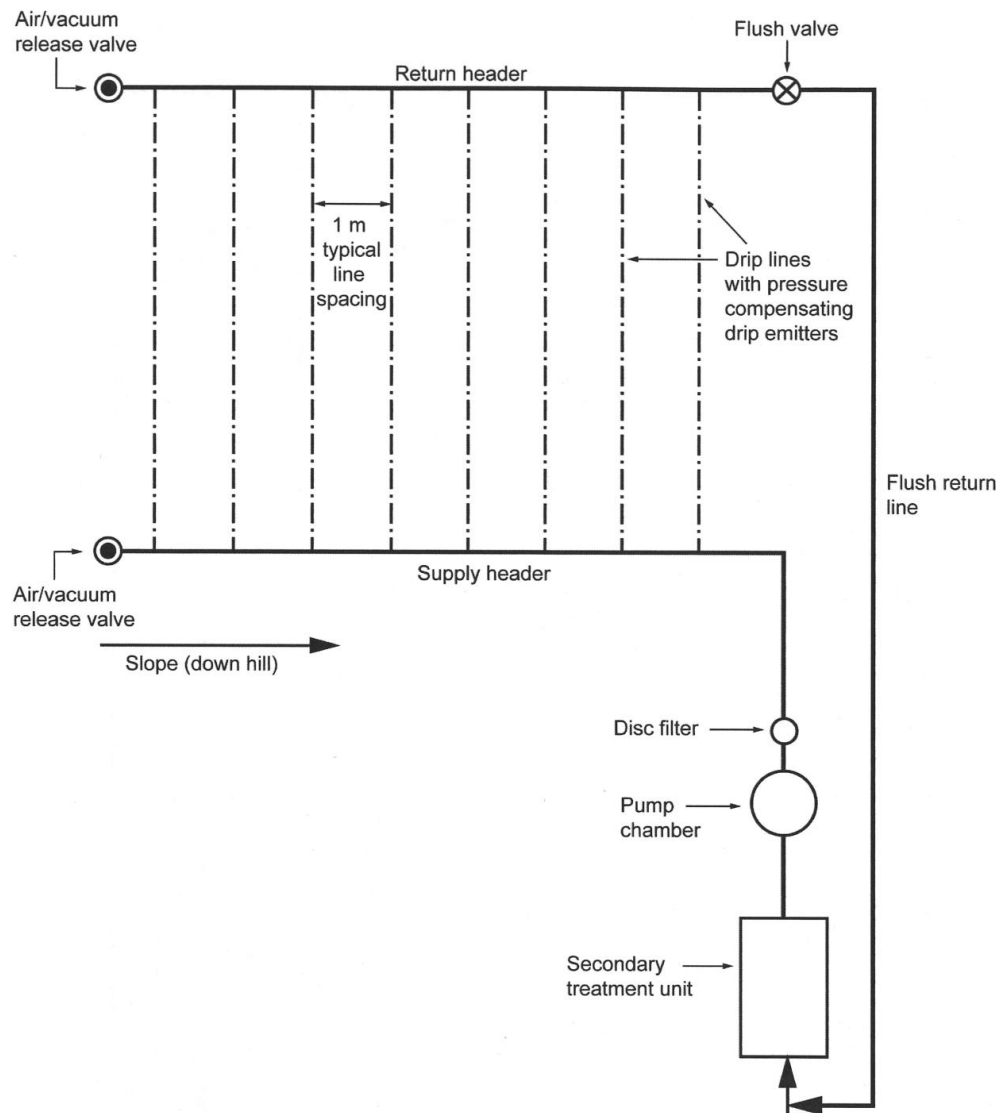


FIGURE 4-3 SURFACE IRRIGATION (SOURCE: AS1547:2012)

#### Key features

- Suitable in all soil categories – relies more on evaporation component of dispersal;
- Suitable where high seasonal groundwater is present;
- Indicative cost to install for standard 6 person system: \$12,000 (includes AWTS unit); and
- Configuration and coverage needs to be designed specifically to meet Mt Gambier conditions.

## 5 Current onsite wastewater management in Mt Gambier

### 5.1 Distribution of existing onsite wastewater systems

Mount Gambier Council currently manages approximately 150 onsite wastewater systems. The majority of systems are concentrated in the existing Country Living Zone north of Tolmer Road between White Street and Milton Street, in the northern development area around Wireless Road West, and in Dohle Road in the east. The number and type of existing systems is provided in Table 5-1. Note that Information on septic tank and domestic wastewater systems on properties in the 2010 Council boundary change is not included in this study.

GIS information provided by Council has enabled the spatial distribution of these systems to be mapped, and they are represented in Figure 5-1. The development zones are also shown so that existing septic systems can be identified within each zone.

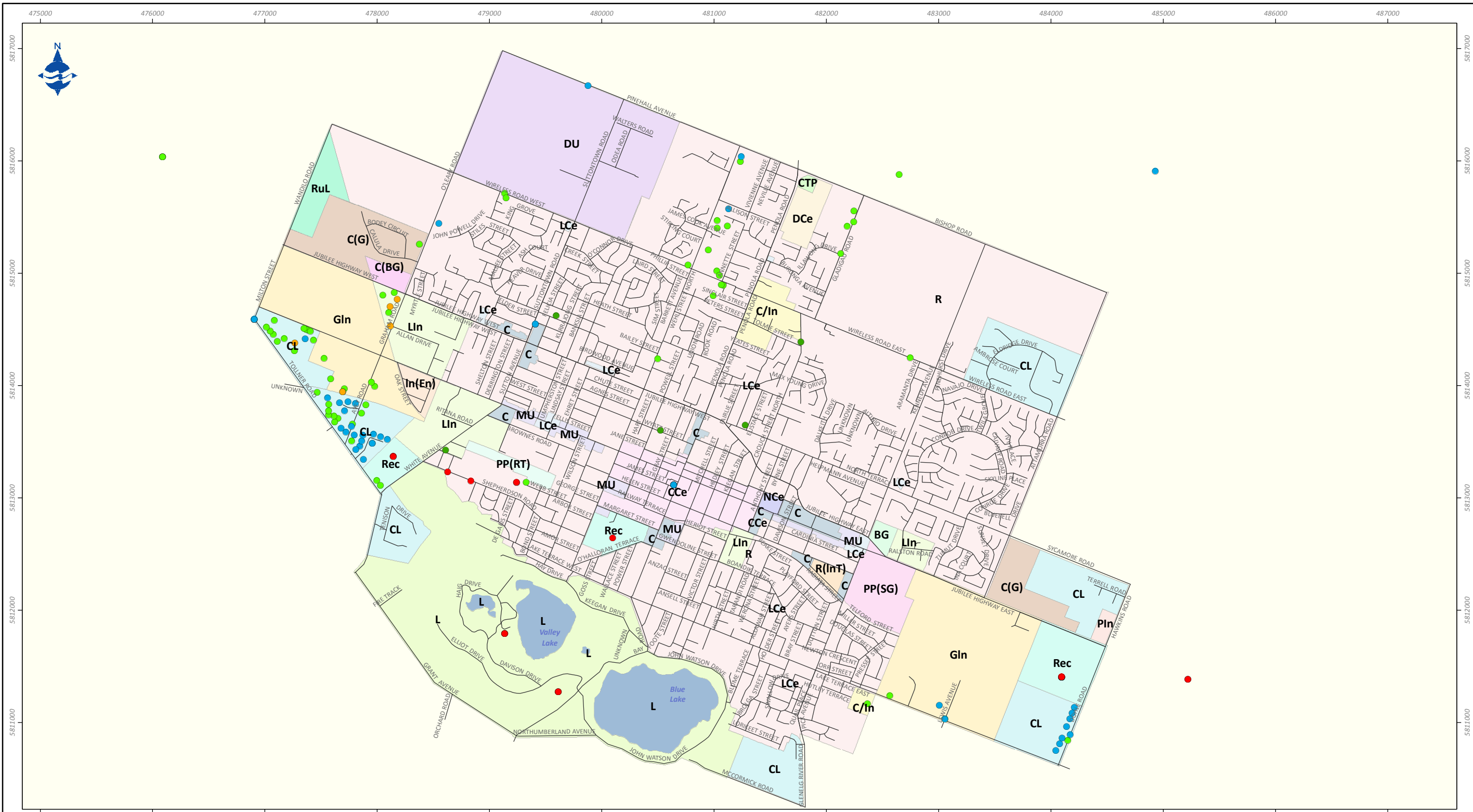
The majority of the 150 existing onsite systems are domestic systems, and there are approximately 15 septic systems that serve commercial or industrial properties, located within commercial development zones.

**TABLE 5-1 EXISTING ONSITE WASTEWATER SYSTEMS**

<b>Septic System type</b>	<b>Number</b>
Septic Tank Absorption	66
Aerobic Systems	48
Public facilities	25
Septic soakage pits/wells	6
Outstanding connections to reticulated sewer	5

From the information provided by Council on the existing onsite systems within the Mount Gambier district, the following identification (as indicated in Figure 5-1) of each system type has been assumed as:

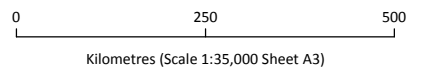
- Septic Tank Systems – are mainly septic tank systems with a minimum 3000 litre capacity treating domestic sewerage and disposal through standard onsite gravity absorption trenches;
- Aerobic Systems – are mainly packaged proprietary aerobic wastewater treatment systems treating domestic sewage and disposal by surface irrigation;
- Public facilities – are council or community owned facilities with an unspecified treatment and disposal system;
- Septic soakage pits – are septic tanks systems treating domestic sewage and disposal by soakage well drainage; and
- Outstanding connections – are existing septic systems on properties that have been advised that a connection to the reticulated sewer network is available.



**LEGEND**

<b>Septic System Type</b>	Road	C/In, Commerce/Industry	L, Lakes	PP(SG), Public Purposes (Show Grounds)
Aerobic	Lake	CCe, City Centre	LCe, Local Centre	R(InT), Residential
Pit disposal system	<b>Planning Zones</b>	CL, Country Living	Lin, Light Industry	R, Residential
Public / Utility	BG, Bulky Goods	CTP, Caravan and Tourist Park	MU, Mixed Use	Rec, Recreation
Septic tank	C(BG), Commercial (Bulky Goods)	DCe, District Centre	NCe, Neighbourhood Centre	RuL, Rural Living
Sewer connection outstanding	C(G), Commercial (Goods)	DU, Deferred Urban	Pin, Industry	In(En), Industry (Enterprise)
	C, Commercial	Gln, General Industry	PP(RT), Public Purposes (Rail Transport)	

**Data Source:**  
Septic Systems, Road, Lake, Planning Zones and Cadastre supplied by City of Mount Gambier.



City of Mount Gambier  
Wastewater Policy Review

**Onsite Wastewater Systems**

## 5.2 Unsewered urban growth areas

The Mount Gambier Development Plan identifies four residential zoned areas within the existing urban development boundary that have been identified as future growth areas. They are North Western Growth Area, North Eastern Growth Area, Northern Growth Area, and Kennedy Avenue Growth Area. Following the re-alignment of the urban development boundary with DC Grant in 2010, these regions (except for the Northern Growth Area which pre-dates the boundary re-alignment) have had concepts developed to guide future development.

## 5.3 SA Water future extension plans

A general map of the Urban Development Boundary was marked up showing 10 regions within Mt Gambier that represent potential areas of growth. It was provided to SA Water for comment on whether SA Water has current or future plans for extension of their sewerage infrastructure to serve development in these areas. The marked up map is provided Figure 5-2, and with reference to the map, SA Water's responses were as follows:

### **Area 1**

SA Water has limited sewerage services in the area and further investigation would be required to determine if any proposed development could be serviced, that is, the provision of services would be driven by the developer.

### **Area 2**

SA Water has limited sewerage services in the area and further investigation would be required to determine if any proposed development could be serviced, and again, the provision of services would be driven by the developer – it would seem that the development LD 732/D029/06 did not proceed and may have lapsed. Note that the subject land is not within the Mount Gambier Water District or Drainage Area.

### **Area 3**

The subject land abuts a short section of 150mm gravity sewer in Wireless Rd West and is not within the Mount Gambier Water District or Drainage Area – SA Water has no record of any land developments proposed or lodged in the area..

### **Area 4**

The area has recently been rezoned "residential" as part of Mount Gambier long term plan/strategy and while there has been some development in the south west corner, there is no indication that any major development will be undertaken in the short term – there are significant sewer augmentation and new pump station works required to service this area.

### **Areas 5 & 6**

Are either currently connected to SA Water's sewerage system or in the process of being connected (i.e.: the "golf course" development).

### **Areas 7 & 8**

Comprise areas zoned "Country Living" (CL) & "Commercial" where it appears that any more recent development undertaken in the CL zone, has not required SA Water's sewerage services, and therefore it is assumed the same would apply for any further development undertaken in the area.

In addition, records indicate that development LD 732/D007/07 did not proceed and may have now lapsed.

Within the area zoned "Commercial", there are sewers located in Jubilee Hwy, on the south of the potential development site, and it may be possible to provide a reticulated sewer to service any future development; again this would require further investigation. In addition, records indicate that development LD 732/D010/07 did not proceed and may have lapsed.

Note also the subject land is not within the Mount Gambier Water District or Drainage Area.

#### **Area 9**

Whilst the land is zoned "Country Living" SA Water's sewerage services have been provided to allotments created by land division, however this may not be the case should further development be undertaken in the area.

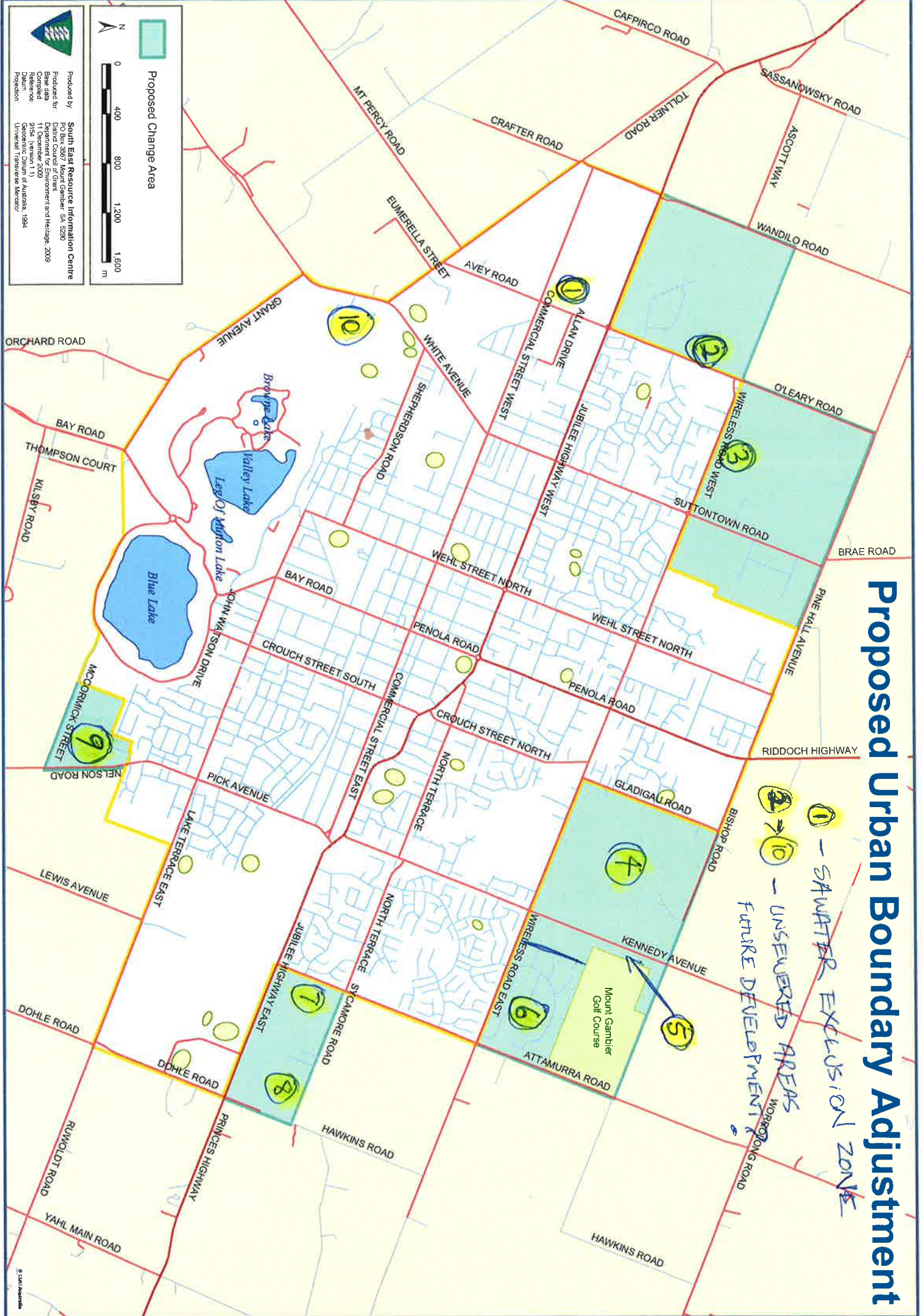
In addition, there have been two land division applications in the area. Firstly, LD 732/D040/06 which created a number of "staged" allotments - SA Water has no record of any further stages proceeding. Secondly, LD 381/D005/11, which SA Water has no record of this development proceeding.

#### **Area 10**

The land is zoned "Country Living" and SA Water's sewerage services have been provided to the allotments.



# Proposed Urban Boundary Adjustment



Proposed Change Area



Produced by South East Resource Information Centre  
 Produced for: Department of Environment and Heritage, 2009  
 Base data: Department of Environment and Heritage, 2009  
 Compiled: 11 December 2009  
 Reference: 9104 (version 1.1)  
 Geometric Control of Australia, 1984  
 UTM Zone 50 South, GDA94

① - SWAMPY EXCLUSION ZONE  
 ②-⑩ - UNSEWERED AREAS FUTURE DEVELOPMENT

Mount Gambier Golf Course

## 6 Recommended changes to policy and practice

### 6.1 General policy considerations

It is recommended that consideration be given to the following list of guidelines that applies to all land uses and zones:

- Commitment to sustaining and improving Public and Environmental Health protection;
- Site and soil assessment undertaken by accredited assessors in accordance with the SA Health Onsite Wastewater Systems Code, including water balance and soil percolation testing where appropriate;
- Inclusion in the Development Plan of a table of onsite wastewater procedures and selection criteria for appropriate onsite systems within designated development zones;
- Consideration for limitation of size of land divisions to accommodate sufficient areas for land application of wastewater and reserve area;
- Recognition of relevant buffer zones in accordance with the Blue Lake Management Plan 2006, with respect to elevated risk of contamination of groundwater systems;
- Requirement for the installation of water-saving devices in all proposed developments, which will reduce wastewater generation;
- Prevent or restrict the approval of developments that demonstrate an elevated risk of contamination of effluent discharge into the receiving environment, or that will involve the installation of inappropriate wastewater systems;
- Prevent residential subdivisions on sites where wastewater may impact on groundwater beneficial uses, groundwater dependant ecosystems, discharge off site or into the receiving environment;
- Allow proposed subdivisions (subject to planning approval) where the applicant can demonstrate an overall improvement in the quality of effluent disposed of on the site by upgrading any existing septic tank system;
- Ensure that Site and Soil Assessments are conducted by suitably qualified professionals and comply with SA Health Onsite Wastewater Systems Code and AS1547:2012 (particularly water balance and nutrient balance);
- Ensure that proposed wastewater systems will maximise the amount of effluent disposal by evapo-transpiration and plant uptake; and
- Ensure that suitable on-site effluent disposal systems are installed for commercial and industrial developments.

## 6.2 Mount Gambier Development Plan

The following clauses from the Mount Gambier Development Plan are reproduced here to identify key aspects and relevant clauses that have a bearing on onsite domestic wastewater management policy, and possible future decision making with respect to wastewater management.

Recommended changes are noted against each current statement below. Generally, the statements are provided for the purpose of giving more weight and detail to current development control provisions, and to provide a 'lead in' to the current implementation of new waste control legislation. The recommended statements are meant to supplement the existing provisions in the development plan, and should be subject to ongoing review.

**TABLE 6-1 RELEVANT CURRENT AND RECOMMENDED DEVELOPMENT PLAN POLICY STATEMENTS**

Zone	Sub-heading	DP Clause	Principles of Development Control - Current Statements	Principles of Development Control - Recommended Statements
<b>MOUNT GAMBIER (CITY)</b>	Infrastructure	5	Development in urban areas should not occur without provision of an adequate reticulated domestic quality mains water supply and an appropriate waste treatment system.	
	Land Division	1 1(c) 2 2(a) 2(e) 2(f)	When land is divided:  provision should be made for the disposal of wastewater, sewage and other effluent from each allotment without risk to health;  Land should not be divided if any of the following apply: the size, shape, location, slope or nature of the land makes any of the allotments unsuitable for the intended use; the wastewater treatment plant to which subsequent development will be connected does not have sufficient capacity to handle the additional wastewater volumes and pollutant loads generated by such development; the area is unsewered and cannot accommodate an appropriate onsite wastewater disposal system within the allotment that complies with (or can comply with) the relevant public and environmental health legislation applying to the intended use(s).	9 Septic tanks should: (a) not be installed where effluent is likely to lead to pollution of surface or underground water; (b) be installed on allotments large enough to allow disposal of effluent within the allotment boundaries; and (c) be located so as to permit the most effective (in accord with SA Water and South Australian Health Commission standards) disposal of effluent within the allotment, notwithstanding other design and siting principles. 20 Effluent and other waste materials from development should be capable of being treated and disposed of without risk to health, or impairment to amenity. 21 Activities which produce large amounts of waste water should not be established unless they can be connected to an approved sewerage or common effluent scheme.
	Public Utilities	1 2 3	Urban type development should not occur unless it is in a zone able to be readily and economically provided with reticulated water, electricity, sewerage, telecommunications and other essential public utilities.  Development intended for human occupation should have a water supply available sufficient for domestic purposes.  Development should not be undertaken unless provision is made for the disposal of sewage, and other wastes, without risk to health or impairment to the environment	Septic tanks are used where sewerage is not available, and their efficiency varies according to the nature of the soil. The effluent should be disposed of within the boundaries of the allotment; therefore the size of an allotment in a septic tank area is governed by the previous nature of the soil.
<b>MOUNT GAMBIER (CITY)</b>				<b>Groundwater Supply Protection OBJECTIVES</b> <b>Objective :</b> Protection of Blue Lake from pollution. <b>Objective :</b> The protection of the Blue Lake Aquifer Recharge Zone against pollution and contamination. <b>Objective:</b> The prevention of development which could lead to deterioration in the quality of surface or underground waters within the Blue Lake

				<p>Aquifer Recharge Zone.</p> <p>The quality of Mount Gambier's water depends upon the effectiveness of pollution controls in the Blue Lake Recharge Zone. The Blue Lake Management Plan 2006 indicates the current buffer zones of the catchment areas for groundwater that serves Mount Gambier's potable water supply.</p> <p>To prevent the quality of water within the Blue Lake reservoir from deteriorating, it is important that development minimises the level of pollution within the recharge zone.</p>
<b>RESIDENTIAL ZONE</b>	Land Division	16	Land division should create vacant allotments with an area not less than 450 square metres, or in the case of affordable housing allotments not less than 300 square metres.	
	Non-compliance	18	<p>Development (including building work, a change in the use of land, or division of an allotment) for the following is non-complying:</p> <p>All new development requiring on-site treatment and disposal of effluent, except where:</p> <p>(a) it is to be connected to an aerobic effluent disposal system in accordance with South Australian Health Commission standards; or</p> <p>(b) in the case of land division, where each allotment is suitable for connection to an aerobic effluent disposal system in accordance with South Australian Health Commission standards.</p>	<p>Development (including building work, a change in the use of land, or division of an allotment) for the following is non-complying:</p> <p>All new development requiring on-site treatment and disposal of effluent, except where:</p> <p>(a) it is to be connected to an approved wastewater treatment system in accordance with SA Health Onsite Wastewater System Code and is appropriate for the site and soil conditions.</p> <p>(b) in the case of land division, where each proposed allotment is suitable for onsite wastewater disposal in accordance with SA Health Onsite Wastewater System Code, which also demonstrates a long term acceptance rate which doesn't contribute to a cumulative impact on surface or groundwater systems.</p>
<b>NORTHERN RESIDENTIAL POLICY AREA 1</b>	Land Division	3	Land division should not create any allotment having an area of less than 8000 square metres unless the allotment can be connected to the existing sewerage system.	
		4	Residential development on allotments exceeding 8000 square metres or an existing vacant allotment should utilise an aerobic waste water treatment system, unless it can be readily connected to the existing sewerage system.	Residential development on allotments exceeding 8000 square metres or an existing vacant allotment should utilise wastewater treatment systems suitable for the zone, unless it can be readily connected to the existing sewerage system.
		5	Residential development on allotments less than 8000 square metres should only occur where it is readily connected with essential services and public utilities.	
		6	Development should not prejudice future residential development of the policy area.	
<b>RESIDENTIAL REGENERATION ZONE (RRZ)</b>	Non-compliance	18	<p>Development (including building work, a change in the use of land, or division of an allotment) for the following is non-complying:</p> <p>All new development requiring on-site treatment and disposal of effluent, except where:</p> <p>(a) it is to be connected to an aerobic effluent disposal system in accordance with South Australian Health Commission standards; or</p> <p>(b) in the case of land division, where each allotment is suitable for connection to an aerobic effluent disposal system in accordance with South Australian Health Commission standards.</p>	

<b>LAKES ZONE</b>		6	<p>The following kinds of development are non-complying in the Lakes Zone:</p> <p>All new development requiring on-site treatment and disposal of effluent, except where it is to be connected, or in the case of land division, each allotment is suitable for connection to an aerobic effluent disposal system in accordance with South Australian Health Commission standards</p>	<p>Development (including building work, a change in the use of land, or division of an allotment) for the following is non-complying:</p> <p>All new development requiring on-site treatment and disposal of effluent, except where:</p> <p>(a) in the case of land amalgamation, it is to be connected to an approved wastewater treatment system in accordance with SA Health Onsite Wastewater System Code and is appropriate for the site and soil conditions, and it is demonstrated that there is no additional adverse impact to the environment;</p>
<b>COUNTRY LIVING ZONE</b>		4  10	<p>Development on allotments exceeding 5000 square metres or an existing vacant allotment should utilise an aerobic waste water treatment system, unless it can be readily connected to the existing sewerage system.</p> <p>The following kinds of development are non-complying in the Country Living Zone:</p> <p>All new development requiring on-site treatment and disposal of effluent, except where it is to be connected, or in the case of land division, each allotment is suitable for connection to an aerobic effluent disposal system in accordance with South Australian Health Commission standards</p>	<p>Development (including building work, a change in the use of land, or division of an allotment) for the following is non-complying:</p> <p>All new development requiring on-site treatment and disposal of effluent, except where:</p> <p>(a) in the case of land amalgamation, it is to be connected to an approved wastewater treatment system in accordance with SA Health Onsite Wastewater System Code and is appropriate for the site and soil conditions, and it is demonstrated that there is no additional adverse impact to the environment;</p>

## 6.3 Considerations for wastewater management

This section discusses some considerations with respect to selection of treatment systems, and recommendations for further investigation.

The following Table 6-2 provides an indication of suitable land application systems as applied to the zones identified as potential unsewered growth areas.

TABLE 6-2 SUITABLE WASTEWATER DISPOSAL SYSTEMS FOR INDIVIDUAL GROWTH AREAS

<b>Development Zone</b>	<b>Soil Capacity (Texture – clay content)</b>	<b>Suitable Onsite Disposal System</b>
<b><i>NORTHERN RESIDENTIAL POLICY AREA 1</i></b>	Sandy soils, low clay content, free draining, Category 1/2	Pressure Dosed Modified Beds Surface dripper irrigation minimum 400m <sup>2</sup>
<b><i>North Western Growth Area 3</i></b>	Sandy to sandy loams. Loamy soils in western most region. Category 2/3	Pressure Dosed Modified Beds Subsurface Irrigation/ LPED Surface dripper irrigation minimum 400m <sup>2</sup>
<b><i>North Eastern Growth Area 4ish</i></b>	Sandy soils, low clay content, free draining, Category 1/2	Pressure Dosed Modified Beds Surface dripper irrigation minimum 400m <sup>2</sup>
<b><i>Northern Growth Area</i></b>	Sandy soils to sandy loams content, moderate draining, Category 2	Pressure Dosed Modified Beds Subsurface Irrigation/ LPED Surface dripper irrigation minimum 400m <sup>2</sup>
<b><i>Kennedy Avenue Growth Area 4</i></b>	Sandy soils, low clay content, free draining, Category 1/2	Pressure Dosed Modified Beds Subsurface Dripper Irrigation/ LPED Surface dripper irrigation minimum 400m <sup>2</sup>
<b><i>Attamurra Golf Course</i></b>	N/A	Connected to SA Water sewerage system
<b><i>RESIDENTIAL REGENERATION ZONE (RRZ)</i></b>	Sandy soils, low clay content, free draining, Category 1/2	Pressure Dosed Modified Beds Subsurface Dripper Irrigation/ LPED Surface dripper irrigation minimum 400m <sup>2</sup>
<b><i>LAKES ZONE</i></b>	Sandy soils, low clay content, free draining, Category 1/2	Pressure Dosed Modified Beds Subsurface Dripper Irrigation/ LPED Surface dripper irrigation minimum 400m <sup>2</sup>
<b><i>COUNTRY LIVING ZONE</i></b>	Sandy soils, low clay content, free draining, Category 1/2	Pressure Dosed Modified Beds Subsurface Dripper Irrigation/ LPED Surface dripper irrigation minimum 400m <sup>2</sup>

### 6.3.1 Recommendations

The following additional recommendations are provided to assist Council to develop suitable actions if required, as a result of this investigation. In general, it is recommended that:

- Secondary treatment of effluent (eg AWTS) be utilised for disposal within the Blue Lake Protection Zone;
- Subsurface disposal systems should be encouraged in preference to surface irrigation systems;
- Priority be given in future budgets and programs for the provision of sewerage facilities to all un-serviced zones in the Mount Gambier urban area;
- All disposal systems incorporate sequential pressure dosing, which allows for more even distribution, and 'resting' time between trenches/ zones (and encourages 'bio-mat' growth);
- Existing Site and Soil evaluations for previous waste control applications be assessed to verify soil information provided in this report; and
- An audit of existing wastewater treatment systems is undertaken to determine whether their performance meets the relevant statutory standards, and assist with the development of policy procedures and performance guidelines specifically in the Mount Gambier setting.