



## **Onsite Sewage Management Strategy**

**Prepared on 23 June 1999**

**Adopted by Council 22 November 1999**

**Reviewed September 2007**

**Reviewed November 2010**

**Adopted by Council 22 November 2010**

**Reviewed November 2013 & January 2014**

**Adopted by Council 30 June 2014**

# On-Site Sewage Management Strategy

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## ON-SITE SEWAGE MANAGEMENT STRATEGY

### 1. Introduction

- 1.1 Effective management of domestic sewage and wastewater is an important consideration for the health of the community and the environment. It requires the active involvement of both the Council and landholders
- 1.2 This Management Strategy has been developed to help Lithgow City Council assess, regulate and manage the selection, design, installation, operation and maintenance of on-site sewage management systems.
- 1.3 This Management Strategy draws upon the principles, technical data and overall advice contained in the publication "*Environment and Health Protection Guidelines – On Site Sewage Management for Single Households*"<sup>1</sup>. A link to this publication is available on Council's website.
- 1.4 This Strategy was originally adopted at Council's meeting held on the 22<sup>nd</sup> November 1999 and subsequently revised in September 2007 and September 2010. This version represents a review conducted in November 2013 and refined in March 2014.
- 1.5 The on-site sewage management strategy is an identified activity within Council's Operational Plan and delivery program and is reported on in Council's Quarterly and Annual Reports and State of Environment Report.

### 2. Purpose

The purpose of the On-site Sewage Management Strategy is to:

- 2.1 Guide landholders towards sustainable on-site management of sewage and waste water disposed of on-site.
- 2.2 Protect and enhance the quality of public health and the environment within the Lithgow Local Government Area (LGA)
- 2.3 To assist Council to prioritise resources for the efficient regulation and monitoring of on-site sewage management systems within its area.

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<sup>1</sup> These guidelines have been developed by the Department of Local Government, NSW Ministry of Health, OEH, the Department of Land and Water Conservation and the Department of Urban Affairs and Planning. The guidelines were published by the NSW Department of Local Government.

### 3. Objectives

The objectives of this On-Site Sewage Management Strategy are –

- 3.1 **Prevention of public health risk** – sewage contains bacteria, viruses, parasites and other disease-causing organisms. Contact with effluent should be minimised or eliminated, particularly for children. Insects and vermin can also act as vectors for disease where they have access to raw sewage.
- 3.2 **Protection of surface water** – on-site sewage management systems should be selected, sited, designed, constructed, operated and maintained to ensure that surface waters are not contaminated by any flow from treated systems and land application areas (including effluent, rainfall runoff and contaminated groundwater flow).
- 3.3 **Protection of groundwater** – on-site sewage management systems should be selected, sited, designed, constructed, operated and maintained to ensure that groundwater will not be contaminated by any flow from either the treatment systems or land application areas.
- 3.4 **Protection of land** - on-site sewage management systems should be selected, sited, designed, constructed, operated and maintained to ensure that land is not contaminated by any flow from treated systems, effluent, rainfall runoff or contaminated groundwater flow.
- 3.5 **Conservation and reuse of resources** – the resources in domestic wastewater (including nutrients, organic matter and water) should be identified and utilised as much as possible within the bounds posed by the other performance objectives; water conservation should be practiced and wastewater production should be minimised.
- 3.6 **Protection of community amenity** – on-site sewage management systems should be selected, sited, designed, constructed, operated and maintained to ensure that they do not unreasonably interfere with quality of life. Where possible, such systems should enhance the local amenity – special consideration should be given to aesthetics, odour, dust, vectors and excessive noise.

### 4. Goals

The goals of the On-site Sewage Management Strategy are to:

- 4.1 Guide Council's development standards and approval criteria for subdivision, development and building to ensure that appropriate provision is made for sustainable on-site sewage management when residential development occurs in non-sewered areas.
- 4.2 Inspect and maintain a database of all on-site sewage management systems within the LGA.

- 4.3 Identify additional public infrastructure needed eg, giving consideration to connecting un-sewered areas of townships to a centralized wastewater management facility.
- 4.4 Adopt a partnership approach with households, businesses and service agents to support continual improvement of on-site sewage management.
- 4.5 Map and maintain details of soil and site conditions and suitability for on-site sewage management systems
- 4.6 Ensure that all on-site waste management systems are inspected by qualified and accredited people at the intervals determined through the risk assessment process.
- 4.7 To cooperate with householders and businesses to develop site-specific sewage management plans which resolve identified problems.
- 4.8 Ensure that suitable and adequate education is provided or is available to all people involved in on-site wastewater management, i.e. Council officers, residents and service providers.

## **5. Environmental Overview of the Lithgow Local Government Area**

### **5.1 Location**

The Lithgow City Council Local Government Area (LGA) is located at the western end of the Blue Mountains and has an area of 4 551 square kilometres. A significant part of the Lithgow LGA lies within the Sydney Drinking Water Catchment.

### **5.2 Climate**

The area has a climate of extremes with hot dry summers and very cold winters with regular frosts and occasional snowfalls. Rainfall is in the range of 600mm – 900mm being relatively evenly distributed throughout the year.

### **5.3 Population**

The Lithgow LGA has a population of 20 160 (ABS Census 2011). Lithgow is the main town with a population of approximately 12,249 while smaller towns are located at Wallerawang, Portland, Cullen Bullen, Lidsdale, Ben Bullen, Clarence, Capertee, Hartley, Rydal, and Tarana. The remaining is rural land.

The towns of Lithgow, Wallerawang and Portland, with approximately 80% of the LGA's population, are provided with reticulated sewerage systems. The remaining population live in un-sewered villages or on rural holdings.

## 5.4 Potential Problem Areas

- Cullen Bullen, located approximately 26km north west of Lithgow on clay soils, has a reticulated water supply but does not have a reticulated sewerage system. Council is giving consideration to alternative means of wastewater disposal in this village.
- The Hartley and Kanimbla Valleys where there are a large number of smaller holdings on granite and clay soils that drain into the Cox's River and Sydney Water Catchment. However stringent approval requirements under the Drinking Water Catchment State Environmental Planning Policy (SEPP) have assisted the situation.
- The villages Glen Davis and Rydal which have a reticulated water supply but no reticulated sewerage system.
- The Village of Capertee which has no reticulated water supply or reticulated sewerage system.

## 6. Assessment

Council has identified the following programs as being necessary for the effective and efficient implementation of its On-site Sewage Management Strategy. It is Council's intention to use these programs to ensure the effective delivery and application of the Strategy.

### 6.1 Approval and Assessment of New Systems

- 6.1.1. Applications will be required for all new on-site sewage management systems. As part of the development assessment process, Council will issue a construction certificate as well as a number of conditions of approval. The construction certificate will identify the types of inspections required throughout the construction of the project. In terms of the on-site sewage management system, Council will require that inspections are carried out when the treatment system is installed and when the land application area is being prepared. All conditions of approval including those relevant to the on-site sewage management system must be adhered to.
- 6.1.2. Soil testing and water balance analysis will be carried out prior to the installation of new systems. This will be carried out by a suitably qualified and competent person; such as a member of the Australian Society of Soil Science (Certified Professional Soil Scientist), or an agronomist, environmental scientist/engineer who is recognised by their industry body as being proficient or who has completed a suitable level of training in on-site wastewater management.
- 6.1.3. After development has been completed on site and before the development may be inhabited, Council or a Principal Certifying Authority must issue an Occupation Certificate. Prior to issuing an Occupation Certificate, the site will be inspected to

ensure the development is consistent with the approved plans and conditions of approval for the project. If inspections have not been carried out in accordance with the construction certificate an Occupation Certificate may not be issued. If a Principal Certifying Authority has issued an Occupation Certificate, Council may choose to conduct random inspections on these sites to ensure works have been signed off in accordance with the approved plans and conditions of consent.

6.1.4. The specifications of various on-site systems will be checked and the system must be listed on the NSW Health Register of Accredited Sewage Management Facilities.

6.1.5. In accordance with the Drinking Water Catchment SEPP, all development applications for or that include on-site sewage management systems and which fall within drinking water catchments will be assessed in accordance with Part 4 of the Environmental Planning and Assessment Act and require referral to the Sydney Catchment Authority (SCA) for assessment using its Development Assessment Model. Where development applications involve on-site wastewater systems, Council will submit the DA, together with the onsite wastewater management report, to the SCA after Council has assessed these against the NorBE tool.

6.1.6. Approval to Operate a New Sewage Management Facility

After development has been completed and following the issuance of an Occupation Certificate, Council will issue an Approval to Operate. This Approval to Operate is similar to the registration of a car and allows the owner of the system to operate the on-site sewage management system. The Approval to Operate will outline the risk that the system poses to public health and the environment and will also specify the frequency in which this system will need to be reinspected. The risk classification used by Council is outlined in section 6.2.

## **6.2 Assessment of Existing Systems and categories of Risk**

6.2.1. All on-site sewage management systems will be allocated a risk rating according to their type, location and proximity to waterways and property boundaries as follows:

### **High Risk Systems**

Septic Systems located within 100 metres of a permanent watercourse or within 12 metres of a property boundary or another residential dwelling.

Septic Systems located on commercial properties including cabins, caravan parks, B&Bs, hotels, mines etc. and or located within a village.

### **Medium Risk Systems**

Septic Systems on land 5 Hectares and less in size.

### **Low Risk Systems**

Septic systems located on rural land greater than 5 Hectares provided they are not located within 100 metres of a permanent watercourse or within 12 metres of a property boundary or another residential dwelling.

All Aerated Wastewater Systems (AWTS).

6.2.2. Where, upon inspection, additional environmental risk assessment factors are identified such as those contained in Attachments 1 and 2, Council will use the parameters identified in the Attachments to determine if the system should be placed in a different risk category. Where it is found necessary to move systems from one classification to another, (eg from low risk to high risk, or vice versa) then the regime of the new risk classification and associated charges will apply.

6.2.3. Council will use the Sydney Catchment Authority's (SCA) Neutral or Beneficial Effect (NorBE) assessment tools including the Development Assessment Module (DAM) to evaluate the potential impacts of on-site wastewater disposal of new developments and upgrades to existing on-site systems for systems in the Sydney drinking Water Catchment.

6.2.4. In undertaking this assessment Council officers will be mindful of the local environment in which the system is to be located and will determine the total impact the system is likely to have on the immediate environment as well as the environment of the Lithgow Council area as a whole.

6.2.5. Council will consult with appropriate organisations that have an interest in the environment (Office of Water, Sydney Catchment Authority, Department of Local Government, The Office of Environment and Heritage, NSW Ministry of Health) where necessary.

6.2.6. Approval to Operate an Existing Sewage Management Facility

After an on-site sewage management system has been completed and, or following any rectification works, Council will issue an Approval to Operate. This Approval to Operate is "Approval to Operate Onsite Sewage Management System". The Approval to Operate will outline the risk that the system poses to public health and the environment and will also specify the frequency in which this system will need to be reinspected. The risk classification used by Council is outlined in section 6.2.1.

### **6.3 Inspections**

6.3.1. All on-site sewage management systems in the Lithgow LGA will be subject to

inspections after they have been approved and installed to ensure that they continue to operate effectively and are not a risk to public health and the environment. The inspection frequency will be determined based on a risk classification determined by Council as outlined in section 6.2.1.

6.3.2. All existing on-site sewage management systems will be initially inspected commencing in 2011. It is expected that the inspection program will take up to three years to complete. The inspection of all existing on-site sewage management systems will allow Council to gain site and soil data associated with the on-site sewage management system and to also apply a risk classification which will identify the frequency of future inspections. The inspection program will also allow Council to identify any problems with on-site systems that may lead to a public health or environmental risk.

6.3.3. The level of risk will determine the frequency of inspection:

- High Risk** systems will be inspected every Two (2) years.
- Medium Risk** systems will be inspected every Five (5) years.
- Low Risk** Systems will be inspected every Ten (10) years.
  
- Aerated Wastewater Treatment Systems (AWTS)** are considered by Council as low risk systems and should be serviced every 3 months as requested. Inspections of AWTS will be undertaken by Council every ten (10) years to ensure that servicing requirements are being met and undertaken to a satisfactory standard. The AWTS must also be inspected and serviced according to the manufacturer's instructions by a service technician approved by Council, at cost to the owner and the service certificate provided within 14 days of the inspection to Council for registration. Failure to submit the certificate may result in Council inspecting the AWTS at cost to the owner or Council issuing a Penalty Infringement Notice.

6.3.4. Council will determine a suitable schedule of review of the risk assessment to ensure the protection of the environment. The need to review the risk assessment will be determined during the annual review of the strategy.

6.3.5. To ensure a consistency of approach, all inspections will utilise the appropriate inspection checklist and attach the completed checklist to the inspection report at the time of lodgement.

6.3.6. Where inspections indicate faulty, defective or unhealthy systems, Council will notify the owner/occupier and then work with them to implement rectification works which will resolve the identified problem/s.

6.3.7. Where the inspection or maintenance certificate continues to be outstanding, a Council Officer may inspect the on-site wastewater system. Inspection fees will be charged for the visit. Council may issue a Penalty Infringement Notice to the owner of the system.

## 6.4 Notice of Inspections

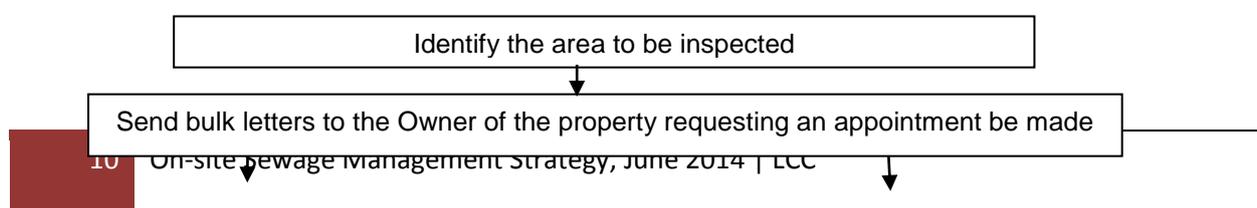
All owners/occupiers with on-site sewage management systems will be advised in writing prior to the inspection of their on-site management system as follows:

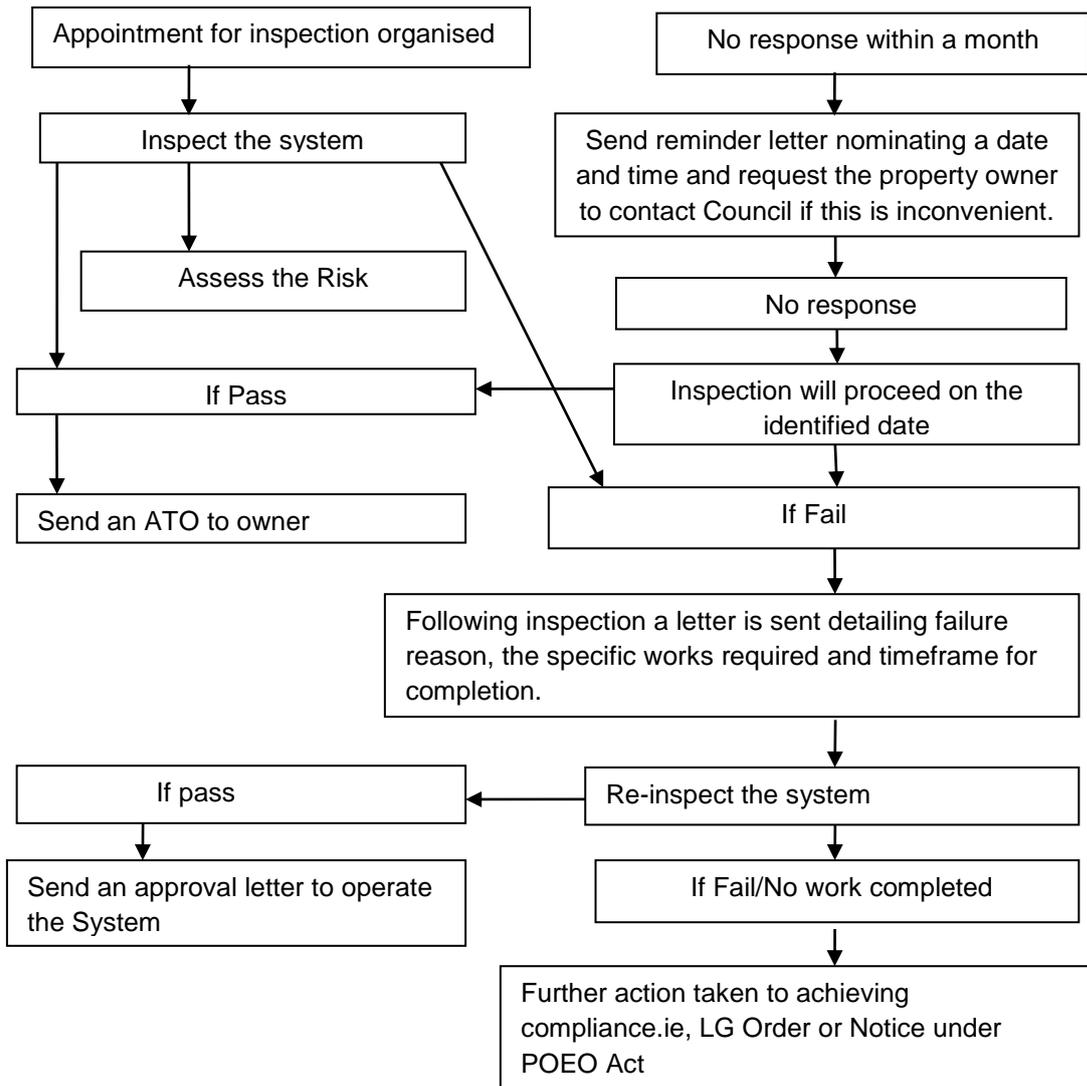
- A letter will be sent advising that Council will be undertaking inspections within the area advising the owner to contact Council within 2 weeks to establish an inspection time and date.
- Where the property owner does not contact Council within 1 month. Council will write again nominating a date and time and again inviting the property owner to contact Council if this is not a suitable time.
- Where there is no contact from the property owner the inspection will proceed on the identified day.
- A telephone call will be placed to the property owner confirming that Council will be inspecting the subject property.
- Written advice will also be provided in relation to the need for further inspections and remediation actions.

## 6.5 Owner and Tennant Notification Procedure:

Prior to Council completing a monitoring inspection, an introductory or renewal letter will be sent to the default mailing address (owner's residential address OR nominated Managing Agent's address) notifying the owners/managing agents of the owner's responsibility to renew or apply for an Approval to Operate. Upon receipt of an application to operate, Council as part of the application assessment process will contact the owner to make arrangements to conduct an inspection of the system.

## 6.6 OSMS Work Procedure Flow Chart





## **6.7 Complaints Response Program**

Response procedures by the Council in the case of complaints, including emergencies, shall be:

- Respond according to Council's Complaint handling policy
- Contact the owner/occupier of the property/properties affected by the emergency.

## **6.8 Community Consultation**

Council will undertake further consultation with the community should it be deemed necessary to make significant amendments or changes to the way in which the Strategy is delivered to residents and businesses. Council's consultation process may include the following individuals, organisations, and agencies:

- Households
- Communities
- Businesses
- Local environment groups
- Landcare
- Sydney Catchment Authority
- Office of Environment and Heritage
- Office of Water
- NSW Ministry of Health

## **6.9 Educational Programs**

Council will undertake educational activities in relation to on-site sewage management systems:

Conduct public awareness activities for on-site sewage householders to ensure they understand the best and most effective ways to maintain their systems. Information will also be available on Council's website including links to other relevant information. Council will utilise resources developed by the NSW Department of Local Government and Sydney Catchment Authority to assist in the development of an educational program.

## 7. Risk Classification, Inspection Frequency and Charges:

Council adopts the following Risk Classification, Inspection Frequency and fee schedule:

Risk Classification	Inspection Frequency	Approval to Operate and Inspection Charges –
High Risk	Every 2 years	2 years Approval to operate. Charges – subject to annual fees and charges
Medium Risk	Every 5 years	5 years Approval to Operate. Charges – subject to annual fees and charges
Low Risk	Septic Every 10 years	10 years Approval to Operate. Charges – subject to annual fees and charges
	AWTS – Every 10 years	Nil approval fee No inspection fee
Multiple Systems		Approval to Operate and Inspection Charges – subject to annual fees and charges
AWTS additional inspection		Charges – per re-inspection where re-inspection required, subject to annual fees and charges

Commercial/industrial Wastewater Management Systems will be inspected annually.

### Multiple Systems

A separate Approval to Operate will be issued for each system with one fee at the single system rate. Combined inspection fee at the single system rate for first hour with additional hourly rate after first hour. System will help to reduce the likelihood of large system failures leading to costly rectification measures. If rectification works are identified as a result of the inspection, Council has powers under the Local Government Act to require these rectification works to be undertaken. Council will seek to minimise costs to landowners.

If major works are required (e.g. installation of new treatment system, installation of new land application area) Council will require that these works are undertaken in accordance with the Environment & Health Protection Guidelines: On-site Sewage Management for Single Households (Silver Book), AS1547:2012 and the SCA's Neutral or Beneficial Effect Assessment Guidelines and Technical Design Guide for On-site Effluent Management Systems. In cases where financial hardship is demonstrated, additional time or a temporary solution may be negotiated.

## 8. Legislation and Approval Requirements

- In implementing this Strategy Lithgow City Council will take into consideration the:
- Environmental Planning and Assessment Act 1979
- Local Government Act 1993 and (General) Regulation 2005
- Protection of the Environment Operations Act 1997
- Public Health Act 2010
- Catchment Management Authorities Act, 2003

### **8.1 Local Government Act 1993 and General Regulation 2005**

The Local Government (General) Regulation 2005 provides the framework for the regulation of onsite sewage management systems.

The primary effect of the regulation and related reforms is that:

- the operation of a system of sewage management (as defined) is a prescribed activity for the purpose of council approval under Section 68 of the Act;
- the council must consider applications for approval to operate a system of sewage management from relevant landowners, determine the least cost approach to performance assurance and implement appropriate supervision;
- the Council may charge application, renewal and inspection fees to recover the cost of supervising facilities which are subject to an operating approval;
- the Council must not approve the installation of a commercially distributed sewage management facility of a type specified in Local Government (Approvals) Regulation, clause 95A unless plans are provided and a certificate of accreditation issued by NSW Health is in force;
- the Council must apply prescribed performance standards, utilising eg the Environment & Health Protection Guidelines: On-site Sewage Management for Single Households (Silver Book), AS1547:2012 and Neutral or Beneficial Effect Assessment Guidelines when determining applications for approval to install or operate sewage management facilities;
- The Council must consider directions or guidelines issued by the Director General of the Department of Local Government in relation to the prescribed performance standards when determining applications for approval.

The act also allows for Council to issue penalty notices for two offences under section 679 of the Local Government Act for:

- Operating a system of sewage management without prior Council approval (s.626(3)); and
- Operating a system of sewage management otherwise than in accordance with the terms of an approval (s.627(3)).

## **8.2 Protection of the Environment Operations Act 1997**

The Act provides local government with increased powers, similar to those of the Office of Environment and Heritage, to investigate pollution incidents and issue notices. Councils are the *Appropriate Regulatory Authority* (ARA) for activities relating to on-site sewage management facilities (excluding Scheduled Premises).

Where an on-site sewage management facility is found to be failing the following actions are available to Council under the POEO Act:

**Clean Up Notices** - are quick responses to pollution incidents. These notices incur an administration fee, set by legislation. If Council spends time and money monitoring the required works, a compliance cost notice may be issued to recover all costs for environment protection activities.

**Prevention Notices** - can be issued where an on-site sewage management facility is operating in an environmentally unsatisfactory manner. These notices incur an administration fee, set by legislation. If Council spends excess time and money monitoring the required actions, a compliance cost notice may be issued to recover all costs for environment protection activities.

## **8.3 Public Health Act 2010 and Public Health Regulation 2012**

All human waste treatment devices must be accredited by NSW Health and listed on the Register of Accredited Sewage Management Facilities.

# **9. Educational Materials**

9.1 An information package will be developed for residents who have on-site sewage management facilities and will be provided to residents prior to inspection. The information package may be targeted at specific areas and provide information on a range of systems. The information package will cover maintenance of a healthy system, inspection, why it is important to maintain a healthy system, and to look at the limitations of the systems.

9.2 Provide information to service providers on Council's qualification requirements, the service provider database, information available for residents, and information on Council's Strategy and Policies relating to this.

## 10. Standards and Guidelines Applying to On-site Sewage Management Systems

In implementing the Strategy, Council will adhere to the standards listed below:

- Environment and Health Protection Guidelines – Onsite Sewage Management for Single Households
- Australian Plumbing and Drainage Code
- AS/NZS 3500:2003 – Plumbing and Drainage
- AS/NZS 1547:2012 – Onsite Domestic Wastewater Management
- Septic Tank and Collection Well Accreditation Guideline December 2001 (includes septic tanks, collection wells, septic closets, greywater tanks, CED pretreatment tanks and sewage ejection pump stations)
- Waterless Composting Toilet Accreditation Guideline, May 2005
- Sewage Management Facility, Sewage Treatment Accreditation Guideline (incorporating AWTS and Sand Filters), May 2005
- AS/NZS 1546 – Onsite Domestic Wastewater Treatment Units
  - Septic Tanks (1998)
  - Waterless Composting Toilets (2001)
  - Aerated Wastewater Treatment Systems (2001)
- AS4419:2003 – Soils for Landscaping and Garden Use
  - AS2698 – Plastic Pipes and Fittings for Irrigation and Rural Application
    - Polyethylene rural pipes (2000)
    - Mechanical joint fittings for use with polyethylene micro irrigation pipes (1990)
  - AS/NZS 3000:2000 – Electrical Installations
  - AS1319:1994 – Safety Signs for the Occupational Environment
- Design and Installing On-Site Wastewater Systems – A Sydney Catchment Authority Current Recommended Practice.
  - Sydney Catchment Authority Neutral or Beneficial Effects Assessment Guidelines.

## 11. Evaluation and Reporting

11.1 Lithgow City Council makes a commitment to the continuing improvement in the regulation and operation of on-site sewage management systems.

11.2 Council will review this Strategy annually to ensure that it reflects the needs and concerns of residents as well as meeting the changing needs of the environment in which Council operates

11.3 Results of the assessment, monitoring and evaluation will be included in

### 11.4 Proposed Actions

Council proposes the following actions to fulfill the goals stated in Section 4:

Goals	Actions
Review Council development standards and approval criteria for subdivision, development and building to ensure that appropriate provision is made for sustainable on-site sewage management when residential development occurs in non-sewered areas.	<ul style="list-style-type: none"> <li>– Identify all areas of Council which are affected by or can affect the OSMS</li> <li>– Identify processes already in place that address the objects and goals of the OSMS</li> <li>• Identify "gaps" in the process with regard to the effective implementation of OSMS</li> <li>– Determine strategies and processes to fill identified gaps</li> </ul>

Goals	Actions
Identify the additional resources needed to support on-site sewage management systems	<ul style="list-style-type: none"> <li>– Conduct audit of existing facilities</li> <li>– Identify gaps in facilities</li> <li>– Community consultation to identify community needs</li> <li>– Make list of possible infrastructure projects</li> </ul>
Survey and maintain a database of all on-site sewage management systems	<ul style="list-style-type: none"> <li>– Update and maintain existing database</li> </ul>
Identify additional public infrastructure needed to support on-site sewage management systems.	<ul style="list-style-type: none"> <li>– Identify current on-site sewage management problems which could be resolved via additional infrastructure</li> <li>– Consult other staff to determine future developments that will require on-site sewage management</li> <li>– Determine costs for additional infrastructure</li> </ul>
Adopt a partnership approach with households and service agents to support continual improvement of on-site sewage management.	<ul style="list-style-type: none"> <li>– Determine ongoing consultation process</li> <li>– Develop a communications strategy</li> <li>– Develop appropriate training programs and educational materials for householders and service agents</li> </ul>
Map and maintain details of soil and site conditions and suitability for on-site sewage management systems	<ul style="list-style-type: none"> <li>– Identify all high risk areas</li> <li>– Determine suitability of all Council areas to support on-site sewage management</li> <li>– Highlight areas assessed as high or medium risk</li> <li>– Require geotechnical reports for all new subdivision applications</li> </ul>

## 12. Glossary of Terms

A glossary of terms relevant to on-site sewage management is contained in Attachment 3.

# Attachment 1 – Risk Assessment Matrix

## RISK ASSESSMENT MATRIX – Onsite Sewage Management Systems THIS FORM IS FOR COUNCIL USE ONLY

Property Address .....Owner/Occupier Name.....Type of System in Use .....

Risk Assessment Factors	Level of risk Points			Notes
	High = 15 - 20	Medium = 10	Low = 5	
In an environmentally sensitive area				
Distance from nearest body of water				
Soil type				
Soil Depth				
Distance to boundaries/ other residential dwelling				
Size of System/No of rooms/occupants				
Slope				
Level of groundwater/nearest bore				
Arrangements for stormwater diversion				
Proximity to human activity				
Age of System				
Vegetation				
Other site specific factors:				
Land Application Area				
<b>Point score totals</b>				<b>Total Point Score</b>

This matrix was completed by:

Name: ..... Signature: ..... Date: .....

Advice sent to householder Date:..... Entered on:.....
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## Attachment 2 - Risk Assessment Factors

### Definitions and Parameters

Risk Assessment Factor	Definition	Parameters	Level of Risk
Environmentally sensitive area	Proximity to sensitive areas including habitat, plant communities, escarpments, wetlands, foreshores, aquatic reserves and declared wilderness areas.	<input type="checkbox"/> < 40m from sensitive area <input type="checkbox"/> 40 – 100m from sensitive area <input type="checkbox"/> > 100m from sensitive area	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Distance from nearest body of water	Distance along the flow path from: <input type="checkbox"/> Permanent water surfaces (eg river, streams, lakes) <input type="checkbox"/> Other waters (eg farm dams, intermittent waterways and drainage channels, etc)	<input type="checkbox"/> Located in a drinking water catchment and the system is within 100m of a drainage depression, dam, body of water or swamp. <input type="checkbox"/> Located more than 100m of a drainage depression, dam, body of water or swamp.	<input type="checkbox"/> High <input type="checkbox"/> Low
Soil type	Capacity of different soil types to cope with the system.	<input type="checkbox"/> Sandy soils and highly permeable soils, located near a watercourse, or heavy clays. <input type="checkbox"/> Light clay soils <input type="checkbox"/> Loams, clay loams	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Soil Depth	The depth of the soil profile	<input type="checkbox"/> < 500mm soil <input type="checkbox"/> 500mm – 1m soil <input type="checkbox"/> > 1m soil	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Distance to boundaries/ other residential dwelling	Proximity of disposal area to neighbouring property boundaries/ other residential dwelling.	<input type="checkbox"/> Located within 12m of neighbouring boundary/ other residential dwelling <input type="checkbox"/> Located more than 12m of neighbouring boundary/ other residential dwelling	<input type="checkbox"/> High <input type="checkbox"/> Low
Size of System/No of rooms/occupants	Ability of the wastewater system to cope effectively with the load it is receiving.	<input type="checkbox"/> Undersize <input type="checkbox"/> Meets or exceeds current standard	<input type="checkbox"/> High <input type="checkbox"/> Low

Slope %	The steepness of the land.	<input type="checkbox"/> Steep slope - >20% <input type="checkbox"/> Moderate slope 5-20%	<input type="checkbox"/> High <input type="checkbox"/> Medium
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Risk Assessment Factor	Definition	Parameters	Level of Risk
		<input type="checkbox"/> Low gradient <5%	<input type="checkbox"/> Low
Level of groundwater/nearest bore	Probability of system to impact on groundwater	<input type="checkbox"/> Close proximity to domestic groundwater well or high ground water aquifer/table <input type="checkbox"/> Not near domestic groundwater wells or high groundwater aquifer/table	<input type="checkbox"/> High <input type="checkbox"/> Low
Arrangements for stormwater diversion	How will stormwater run-on impact on the system ie is the stormwater adequately diverted away from the system.	<input type="checkbox"/> No stormwater diversion/poor stormwater diversion <input type="checkbox"/> Minimal stormwater impacts <input type="checkbox"/> Stormwater run-on diversion does not impact on the land application area	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Age of system	How old is the system and the land application area.	<input type="checkbox"/> > 15 years <input type="checkbox"/> Between 5 – 15 years <input type="checkbox"/> < 5 years	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Vegetation	Assessment of the type and health of vegetation growing within and directly down slope of the land application area.	<input type="checkbox"/> Effluent visible on service, ground damp and spongy, excessive growth of moisture tolerant vegetation <input type="checkbox"/> Some growth of moisture tolerant vegetation or “lush” grass growth, no visible pooling or surface moisture. <input type="checkbox"/> No visible signs of surface moisture or excessive growth of surrounding vegetation.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Proximity to human activity	The proximity of the system to public recreational land use this includes schools, parks, camp grounds etc.	<input type="checkbox"/> < 30m to public recreational or within public recreational area <input type="checkbox"/> 30 – 150m to public recreational area <input type="checkbox"/> > 150m to public recreational area	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low

Land Application Area		<input type="checkbox"/> Failure <input type="checkbox"/> Signs of moisture <input type="checkbox"/> No signs	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Other site specific factors:			

**Weightings/scores:**

Low = 60 - 100

Medium = 105 - 150

High = 155 - 240

## Attachment 3 - Glossary of Terms

**Absorption:** uptake of liquid into soil

**Adsorption:** increased concentration of molecules or ions on a surface, including exchangeable cations and anions on soil particles

**Aerated Wastewater Treatment System (AWTS):** a wastewater treatment process typically involving:

- settling of solids and floatation of scum
- oxidation and consumption of organic matter through aeration
- clarification – secondary settling of solids, and
- disinfection of wastewater before surface irrigation

**Aerobic:** dissolved or free oxygen is present

**Anaerobic:** dissolved or free oxygen is not present

**Anaerobic Digestion:** decomposition of sludge in the absence of free oxygen

**Anion:** negatively charged ion; can be a single element such as chloride (Cl<sup>-</sup>) or a compound such as nitrate (NO<sub>3</sub><sup>-</sup>)

**Biochemical Oxygen Demand (BOD):** a measure of the dissolved oxygen required for the breakdown of organic material in the effluent; usually refers to a 5 day test (BOD<sub>5</sub>), which typically represents 70 – 80% of the total BOD in a sample; expressed in milligrams per litre (mg/L)

**Biological Film:** (zoogloal film) gelatinous-like film that forms on the surfaces of inert materials, forming the media in a biological filter; it can contain bacteria, protozoa and fungi, and is the site where organic matter in wastewater is oxidised or degraded

**Biosolids:** primarily organic solid product produced by wastewater treatment processes. The solids become biosolids when they come out of a digester or other treatment process and can be beneficially used. Until such solids are suitable for beneficial reuse they are defined as wastewater solids

**Blackwater:** human excreta and water grossly contaminated with human excreta, for example toilet wastewater (although not strictly water-based, human excreta entering waterless composting toilets is considered as 'blackwater')

**Cation:** positively charged ion; can be a single element such as potassium (K<sup>+</sup>) or a compound such as ammonium (NH<sub>4</sub><sup>+</sup>)

**Cation Exchange Capacity (CEC):** a measure of the ability of a soil to attract and hold cations by electrical attraction; three important plant nutrients are the cations calcium (Ca<sup>2+</sup>), magnesium (Mg<sup>2+</sup>), and potassium (K<sup>+</sup>)

**Centralised Sewerage System:** the collection of all sewer and sewerage works vested in the local authority. Usually consists of a wastewater transport system (sanitary drainage system and/or road tanker) and centralised wastewater management facility for many premises

**Centralised Wastewater Management Facility:** a facility vested in the local authority and designed for the management of wastewater and/or septage generated by many households. Examples of possible facilities are:

- package treatment plants
- full-scale sewage treatment plants
- biosolids management facilities
- effluent reuse facilities
- effluent discharge facilities

**Compost:** the material produced by the aerobic biological decomposition of the organic constituents of a material

**Constructed Wetland:** constructed area where the water surface is near ground level for enough of the year to maintain saturated soil conditions and promote related vegetation

**Denitrification:** transformation of nitrate into the gaseous NO and N forms; denitrification is an anaerobic process carried out by micro-organisms; it can occur only if the soil becomes oxygen deficient (for example, as a result of waterlogging)

**Desludging:** withdrawing sludge, scum and liquid from a tank

**Disinfection:** a process that destroys, inactivates or removes pathogenic micro-organisms

**Domestic Wastewater:** wastewater arising from household activities, including wastewater from bathrooms, kitchens and laundries

**Electrical Conductivity (EC):** an electrical measure of the concentration of salts in solution; the salts that occur in significant amounts in domestic wastewater are the chlorides, sulphates and bicarbonates of sodium, potassium, calcium and magnesium; in water these salts dissociate into charged ions and the EC of the solution is proportional to the concentration of these ions. The units of EC are deciSiemens per metre (dS/m) at 25°C

### **Environmentally Sensitive Area**

The Environmental Planning and Assessment Regulation Schedule 3 Part 4 38 defines environmentally sensitive areas as:

- (a) land identified in an environmental planning instrument as an environment protection zone such as for the protection or preservation of habitat, plant communities, escarpments, wetland or foreshore or land protected or preserved under State Environmental Planning Policy No 14—Coastal Wetlands or State Environmental Planning Policy No 26—Littoral Rainforests, or
- (b) land reserved as national parks or historic sites or dedicated as nature reserves or declared as wilderness under the National Parks and Wildlife Act 1974, or
- (c) an area declared to be an aquatic reserve under Division 2 of Part 7 of the Fisheries Management Act 1994, or
- (d) land reserved or dedicated within the meaning of the Crown Lands Act 1989 for the preservation of flora, fauna, geological formations or for other environmental protection purposes, or
- (e) land declared as wilderness under the Wilderness Act 1987.

**Evapo-transpiration:** removing water from soil by evaporation and from plants by transpiration

**Faecal Coliforms (fc):** a type of bacteria that live only in the gut of warm-blooded animals. Can be detected in the general environment if that environment is contaminated with human excreta, and therefore can act as an indicator of recent faecal contamination

**Greywater:** (sullage) domestic wastewater, excluding toilet waste

**Groundwater:** all underground waters

**Human Excreta:** human faeces and urine

**Human Waste Storage Facility (HWSF):** device for holding or disposing of human waste, including a cesspit, chemical closet and pan toilet.

**Human Waste Treatment Device (HWTB):** device for treating human excreta and other wastewater, including a septic tank, aerated wastewater treatment system, septic closet, water closet, human closet and combustion closet

**Hydraulic Loading Rate (hydraulic load, hydraulic loading):** the amount of liquid applied to land over a specified time interval. Can be expressed as either a depth or a volume (with one millimetre of application equal to one litre per square metre)

**Land Application Area:** the area over which treated wastewater is applied

**Land Application System:** system that can consist of pumps, pipes, nozzles, or trenches designed to apply wastewater evenly over a land application area. Includes both irrigation systems and soil absorption systems

**Nitrification:** transformation of inorganic ammonium ( $\text{NH}_4^+$ ) into nitrate ( $\text{NO}_3^-$ )

**Nutrients:** chemical elements that are essential for sustained plant or animal growth; the major nutrients essential for plant growth are nitrogen, phosphorus and potassium; in excess, nitrogen and phosphorus are

potentially serious pollutants and encouraging nuisance growths of algae and aquatic plants in waters and (in the case of nitrate) posing a direct human health risk

**Organic Matter:** material consisting of chemical compounds based upon carbon skeletons (proteins, carbohydrates and fats); may be present in dissolved, suspended and colloidal form; it is usually measured as BOD in a liquid

**Organic Matter Loading:** the amount of organic matter applied to land over a specified time interval. The amount of organic material in effluent is usually expressed as BOD

**Partial Onsite Sewage Management (partial onsite management):** the preliminary treatment of wastewater onsite, followed by management in a centralised sewerage system

**Pathogens:** micro-organisms that are potentially disease-causing; these include but are not limited to bacteria, protozoa and viruses

**Percolation:** the descent of water through the soil profile

**Permeability:** the general term used to describe the rate of water movement through a soil

**pH:** a measure of hydrogen ion concentration. It is an indicator of acidity or alkalinity and ranges from 0 – 14, where 0 is the most acid, 14 the most alkaline, and 7 neutral

**Potable:** water of a quality suitable for drinking and domestic use that does not deteriorate on storage and that does not contain pathogenic organisms

**Precipitation:** deposits of water, either in liquid or solid form, that reach the earth from the atmosphere

**Recirculating Aerobic Sand Filter Device (RASFD):** (intermittent sand filter) provides further treatment of pre-treatment wastewater by percolation through graded sand

**Regolith:** loose, incoherent fragments of soil, alluvium, etc. which rests upon solid rock

**Residual Chlorine:** chlorine remaining in solution after a specified period of contact between solution and the chlorine

**Reticulated Water Supply:** the provision by a water authority of water for potable and non-potable uses to households through a network of pipes

**Run-off:** the part of the precipitation and /or irrigated effluent that becomes surface flow because it is not immediately absorbed into or detained on the soil

**Run-on:** surface water flowing on to an irrigation area as a result of run-off occurring higher up the slope

**Sanitary Drainage System:** an assembly of pipes, fittings and apparatus used to collect the discharge from the sanitary plumbing system and convey it to a centralised wastewater management facility

**Sanitary Plumbing System:** an assembly of pipes, fittings and appliances used to collect wastewater from household drains and convey it to the sanitary drainage system

**Scum:** material that collects at the top of primary wastewater treatment tanks, including oils, grease, soaps and plastics

**Septage:** material pumped out during desludging; contains partly decomposed scum, sludge and liquid

**Septic Tank:** wastewater treatment device that provides a preliminary form of treatment for wastewater, comprising sedimentation of settleable solids, floatation of oils and fats, and anaerobic digestion of sludge

**Septic Wastewater:** wastewater that contains no dissolved oxygen; it is black, has foul odour, and contains high numbers of pathogenic organisms

**Sewage:** waste matter which passes through sewers.

**Sludge:** mainly organic semi-solid product produced by wastewater treatment processes

**Soil Absorption System:** (includes leach drains, drain fields, absorption trenches, seepage beds and seepage pits) subsurface land application systems that rely on the capacity of the soil to accept and transmit the applied hydraulic load

**Suspended Solids (SS):** in wastewater analysis: solids retained after filtration through a glass fibre filter paper followed by washing and drying at 105<sup>0</sup>C, or by centrifuging followed by washing and removal of the supernatant

liquid; expressed in milligrams per litre (mg/L)

**Vectors:** insects or animals, such as flies, mosquitos or rodents, that are attracted to putrescible organic material in wastewater and wastewater treatment systems, and that spread disease

**Waterless Composting Toilet:** (humus closet, biological toilet) waterless system that uses the principle of composting to breakdown human excreta to a humus-type material. The liquid fraction is evaporated or directed to an appropriate management system

**Wet Composting Toilet:** treats all household wastewater and putrescible household organic solid wastes such as food waste. Uses the principle of aerobic composting to break down the solid waste; the liquid component is directed to a land application system after passing through the pile of solids

Glossary definitions from: Department of Local Government, EPA, NSW Health, Department of Land & Water Conservation, Department of Urban Affairs & Planning, (February 1998), *Environment & Health Protection Guidelines – Onsite Sewage Management for Single Households*.