

COUNCIL OF CAMDEN



SEWAGE MANAGEMENT STRATEGY

June 2006

Prepared by the Environment and Health Branch

**Camden Council
37 John Street
CAMDEN NSW 2570**

**PH: (02) 4654 7777
FAX: (02) 4654 7829
FILE: TC-774**

Strategy adopted by Council on: 26th June 2006

Strategy in effect from: 17th July 2006

CONTENTS

1. TITLE	5
2. INTRODUCTION	5
3. BACKGROUND	5
4. PURPOSE	6
5. APPLICATION OF THIS STRATEGY	6
6. OBJECTIVES	7
Figure 1. Unsewered streets within the Camden Local Government Area	8
7. RELATIONSHIP TO OTHER DOCUMENTS	8
7.1 The Local Government Act 1993	9
7.2 The Environment and Health Protection Guidelines for On-site Sewage Management for Single Households	10
7.3 Protection Of The Environment Operations Act 1997 (POEO Act)	10
7.4 AS/NZS 1547:2000 On-Site Domestic-Wastewater Management	11
7.5 AS/NZS 1546:1998 On-Site Domestic Wastewater Treatment Units	11
Part 1: Septic tanks	11
Part 2: Waterless composting toilets	11
Part 3: Aerated wastewater treatment systems	11
7.6 AS/NZS 3500 Plumbing and Drainage	11
8. EXEMPTIONS	12
9. APPROVAL REQUIRED TO INSTALL A SEWAGE MANAGEMENT FACILITY	12
10. PERFORMANCE CRITERIA	13
11. THE APPROVAL TO INSTALL PROCESS	13
Figure 2. Application To Install a Sewage Management System Flow-chart	14
12. MATTERS TO ACCOMPANY AN APPLICATION TO INSTALL, CONSTRUCT OR ALTER A SEWAGE MANAGEMENT SYSTEM	15
12.1 Site Plan	15
12.2 Specifications	15
12.3 Site Assessment	16
12.4 Statement	16
12.5 Operation and Maintenance. (Required for AWTS)	16
12.6 Wastewater/Geotechnical Report	17
12.7 Approval to Operate	17
13. ASSESSMENT PROCESS	17

14. OPERATION OF A SEWAGE MANAGEMENT SYSTEM	17
15. COMMERCIAL SYSTEMS	18
15.1 On-site Sewage Management Facilities >10EP not Accredited by the New South Wales Health Department	18
15.1.1 Monitoring Program	19
16. MATTERS TO ACCOMPANY APPLICATIONS TO INSTALL, CONSTRUCT OR ALTER COMMERCIAL SEWAGE MANAGEMENT SYSTEMS	19
17. MATTERS TO CONSIDER – APPROVAL TO INSTALL/CONSTRUCT/ALTER A SEWAGE MANAGEMENT SYSTEM	20
17.1 Requirement for an On-Site Sewage Management Facility to be Accredited	20
17.2 Other Systems	20
17.3 Dual Occupancy	20
17.4 Sizing of Effluent Application Areas	21
17.5 Reserve area	21
17.6 Flood Potential	21
17.7 Water Usage	22
Table 1. Typical Domestic-Wastewater Flow Design Allowance	22
17.8 Design Wastewater Flow Allowances	23
17.9 Sizing Of Septic Tanks	24
18. APPROVAL REQUIRED TO OPERATE A SEWAGE MANAGEMENT FACILITY	24
18.1 Approval Required To Operate A System Of Sewage Management	24
18.2 Renewal of an Approval to Operate	24
18.3 The Approval to Operate Process	25
Figure 3. The Approval to Operate Process	26
18.4 Inspection Regime	27
18.5 Failing Systems	27
19. OPERATION OF A SEWAGE MANAGEMENT FACILITY	28
19.1 Responsibility of the Owner or Occupier	28
20. MATTERS TO CONSIDER IN THE OPERATION OF A SEWAGE MANAGEMENT SYSTEM	29
20.1 Maintenance of Septic Tanks	29
20.2 AAA Water Saving/Low Flow Devices	29
20.3 AWTS Maintenance and Service Technicians	30
21. SUPPORTING TECHNICAL CONSIDERATIONS	32
21.1 Buffer Distances	32
Table 3. Buffer Distances (applicable to both domestic and non-domestic installations)	32

21.2 Additional Buffer Distances	32
21.3 Vegetation	33
21.4 Maintenance of REAA's	33
21.5 Treatment Systems	33
21.6 Related Effluent Application Areas (REAA's)	34
21.7 Design Requirements for Related Effluent Application Areas - Evaluation Criteria.	35
21.8 Wastewater Site Report - Details to be included	36
Table 4. Determination of Soil Category	37
21.9 Site Features	39
Table 5. Average Climatic Conditions in Camden LGA	39
21.10 AWTS Irrigation Systems	40
Table 6. Expected Quality of Wastewater after Treatment in an AWTS.	40
21.11 Evapo-Transpiration Systems	42
Figure 4. Evapotranspiration - absorption bed	42
Figure 5. Conventional Bed	43
21.12 Construction of Transpiration Beds	43
21.13 Absorption Trench Systems	44
21.14 Composting Toilets	44
Table 7. Composting Toilet Sizing	44
23. FEES & CHARGES	45
24. AMENDMENTS AND VARIATIONS	45
25. DEFINITIONS	46
26. REFERENCES	55
Appendix 1. Order Process	56
Appendix 2. Application form for Approval to Install a Sewage Management System	57
Appendix 3. Request for a Sustainable Effluent Application Area	60
Appendix 4. Sample Site Plans	62
Appendix 5. Sustainable Effluent Application Areas	65
Appendix 6. Application for Approval to Operate a Sewage Management System	67
Appendix 7. Risk Assessment Form - Approval to Install	69
Appendix 8. Matters to accompany Applications to Install / Construct / Alter	
Commercial Sewage Management System	71
Appendix 9 Approval to Operate a Sewage Management Systemy -	
Site Inspection Form	75
Appendix 10. Vegetation Suitable for Land Application Areas	83
Appendix 11. Transpiration Bed - Cross Section & Plan View	84

1. TITLE

The title of this Strategy is: - “Council of Camden Sewage Management Strategy.”

This Strategy consists of a written statement with accompanying diagrams where necessary to enhance comprehension.

This Strategy was adopted by *Council* on the 26th June 2006 and came into force on the 17th July 2006.

This Strategy was prepared by *Council*'s Environment and Health Branch.

2. INTRODUCTION

Camden Local Government Area (*LGA*) covers an area of 206 square kilometres and is approximately 61 km south west of the Sydney CBD. It is estimated that there are over 300,000¹ *on-site sewage management systems* across NSW, Camden *LGA* contains approximately 3000 of these. There is potential for many more such systems to be installed based on existing stocks of un-occupied un-sewered landholdings and future sub-division potential. Existing *on-site sewage management systems* vary greatly in age, design, installation, user loading and operation. User knowledge and maintenance standards greatly influence the performance of these systems.

The unsewered areas of Camden *LGA* (Figure 1) include; the village area of Cobbitty, rural areas (approximately 83% of *LGA*) including Catherine Field, Bringelly, Cawdor, Rossmore, Leppington, Oran Park, Spring Farm, Bickley Vale and the rural-residential areas of Ellis Lane, Grasmere, Kirkham, sections of Elderslie and isolated streets where *Sydney Water Corporations* (*SWC*'s) reticulated *sewerage* is unavailable.

3. BACKGROUND

In March 1998 the NSW Minister for Local Government introduced The Local Government (Approvals) Amendment (Sewage Management) Regulation 1998 and the Environment and Health Protection Guidelines in response to studies conducted in NSW which indicated both a failure rate of up to 70%² of *on-site sewage management systems*, and an enormous potential for unsatisfactory cumulative impacts on the *environment* and on public health arising from the previous ad-hoc management strategies/methods. The above-mentioned Regulation has since undergone review and the relevant legislation is now contained within the Local Government (General) Regulation 2005.

The Regulation and Guidelines have clarified the responsibilities of both *Council* and Landholders in relation to the installation and operation of on-site sewage management systems to ensure long-term compliance with the specified environmental and Public Health Performance Criteria (stated in Section 10).

¹ http://www.dlg.nsw.gov.au/dlg/dlghome/dlg_InformationIndex.asp?areaindex=SEPTIC&index=150

² <http://www.dlg.nsw.gov.au/dlg/dlghome/documents/Information/ssguide.pdf>

4. PURPOSE

The purpose of this strategy is:

1. to define the land upon which Camden Council is the Appropriate Regulatory Authority for the approval and on-going management of *on-site sewage management (OSSM) facilities* and *related effluent application areas*;
2. to set out the means by which *Council* is empowered to undertake these responsibilities;
3. to set out the objectives and criteria for the assessment of *OSSM* facilities;
4. to set out the process(s) for the approval and installation of new *OSSM* systems and the on-going operation of *OSSM* systems

5. APPLICATION OF THIS STRATEGY

This Strategy applies to:

1. all land within the Camden Local Government Area **not** provided with *Sydney Water Corporation* (SWC) reticulated *sewerage* infrastructure (refer to Figure 1);
2. any allotment of land within the Camden Local Government Area that is required to pump to SWC infrastructure;
3. all existing and proposed installations of *on-site sewage management systems* on residential, rural commercial **and** industrial premises;
4. all Development Applications for new or amended/altered works on land so defined above;
5. all subdivisions in the Camden Local Government Area that are not provided with *Sydney Water Corporation* reticulated *sewerage* mains, or required to pump to such mains.

6. OBJECTIVES

The objectives of this Strategy are to ensure that on-site sewage management systems in the Camden Local Government Area are installed and operated in a manner that ensures the following:

- a) promote the principles of Ecologically Sustainable Development;
- b) prevention of risks to public health;
- c) protection of surface and *groundwater* resources;
- d) protection of soils and vegetation;
- e) reuse of a valuable local resource; and
- f) maintenance and improvement of community amenity.

Figure 1. Unsewered Streets within the Camden Local Government Area



7. RELATIONSHIP TO OTHER DOCUMENTS

In the event that the relevant Legislation, Guidelines or Australian Standards are revised post the adoption of this Strategy, the revised documents are to replace the repealed documents specified in Section 7 of this Strategy.

This Strategy is to be read in conjunction with:-

7.1 The Local Government Act 1993

The Local Government (General) Regulation 2005 (under section 68 of The Local Government Act 1993 - Approvals).

This legislation:

- a) specifies requirements for the design, installation, alteration and operation of domestic on-site sewage management systems, under s. 68 and s.68A of the Act, and allows fees to be charged under s. 608;
- b) specifies information required to accompany an application to operate, install or alter an on-site sewage management system;
- c) clarifies accreditation roles and responsibilities of the New South Wales (NSW) Health Department;
- d) describes minimum performance criteria for the installation and operation of on-site sewage management systems;
- e) prescribes where public health or the environment are at risk an Order under Section 124 of the Act may be issued depending on the situation, including Orders - 21, 22, 24, 25, 30 or an Emergency Order (which may be issued where public health or the environment is at risk)(refer to Appendix 1);
- f) provides that following the expiration of an Order, a Penalty Infringement Notice (PIN) under the Act may be issued depending on circumstances (refer to Appendix 1);
- g) the Local Government (General) Amendment (Penalty Notice Offences) Regulation 2001 enables Council to issue penalty notices for two existing offences under the Local Government Act 1993;
 - (i) *a person who carries out an activity specified in Parts B-F of the Table to section 68 without having obtained a prior approval of the Council under Part 1 of Chapter 7 required for the carrying out of that activity is guilty of an offence. {s.626(3)}; and³*
 - (ii) *a person who has obtained the approval of the council under Part 1 Chapter 7 to the carrying out of an activity specified in Parts B-F of the Table to section 68 and who carries out that activity otherwise than in accordance with the terms of that approval is guilty of an offence {s.627(3)};⁴*

³ Local Government Act NSW 1993, S626(3)

⁴ Local Government Act NSW 1993, S627(3)

- h) the *Local Government (General) Amendment (Penalty Notice Offences) Regulation 2001* prescribes a penalty of 3 penalty units (\$330 at the time of the adoption of this Strategy) for operating a system of sewage management without prior Council approval. A penalty of 3 penalty units (\$330 at the time of the adoption of this Strategy) is prescribed for the offence of operating a system of sewage management otherwise than in accordance with the terms of Council approval.

7.2 The Environment and Health Protection Guidelines for On-site Sewage Management for Single Households

These Guidelines, which are called up in the regulations and dually empowered by the application of the regulations recommend that Councils should:

- a) *develop, implement and regularly review a Sewage Management Strategy*⁵;
- b) consider all issues relating to approving the installation and operation of on-site sewage management facilities, particularly environment and health issues;
- c) develop conditions of Approval to Operate for systems of on-site sewage management and specific sites;
- d) undertake ongoing community education programs; and
- e) implement a long-term program of on-site sewage management facility audits (site assessments) to monitor the performance and impact of on-site sewage management facilities on the wider environment.

7.3 Protection Of The Environment Operations Act 1997 (POEO Act)

The Act provides local government with increased powers, similar to those of the Environment Protection Authority, to investigate 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 detected to be failing the following actions are available to Council under the POEO Act;

- a) Clean Up Notices - are quick responses to pollution incidents. These notices incur an administration fee, set by legislation at the time of the adoption of this Strategy at \$320. ***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.***
- b) 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 at the time of the adoption of this Strategy at \$320. ***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.***

⁵ Environment & Health Protection Guidelines, On-site Sewage Management for Single Households

- c) Following the expiration of the above Notices and where the works have not been satisfactorily completed, a Penalty Infringement Notice (PIN) under the Act may be issued or further legal proceedings through the Courts.
- d) Penalty Infringement Notice (PIN) for water pollution – an on the spot fine (PIN) may be issued where an on-site sewage management facility is operating in a manner which is causing the pollution of waters (as defined under the POEO Act) is guilty of an offence.

7.4 AS/NZS 1547:2000 On-Site Domestic-Wastewater Management

This standard provides specific details for a range of domestic on-site sewage management facilities and land application areas for all persons and agencies involved with on-site sewage management in Australia and New Zealand.

The Standard provides guidance for:

- a) system flows up to a maximum of 14,000L/week and population equivalent of up to 10 persons; and
- b) site investigation, land application system design, installation, operation and maintenance to achieve sustainable outcomes and public health performance.

7.5 AS/NZS 1546:1998 On-Site Domestic Wastewater Treatment Units

Part 1: Septic tanks.

This standard is highly relevant to manufacturers of on-site sewage management facilities, by specifying technical means of system compliance and test specifications to achieve sustainable outcomes and public health performance.

Part 2: Waterless composting toilets.

This standard covers the requirements of waterless composting toilets that are intended primarily as stand-alone units for residential use but may be suitable for non-residential applications.

Part 3: Aerated wastewater treatment systems.

This standard sets out performance requirements, design requirements, means of compliance, installation requirements, requirements for operation and maintenance and specifications for testing aerated wastewater treatment systems (AWTS) and associated fittings.

7.6 AS/NZS 3500 Plumbing and Drainage

This standard is highly relevant to the licensed plumbers and installers who conduct repairs or alterations to existing on-site sewage management facilities or new installations. This standard covers the requirements for the design and installation of any plumbing and drainage.

8. EXEMPTIONS

There are no exemptions to this strategy however certain installations or portions of installations, which are unusual or large due to particular circumstances, may not be covered in detail by this Strategy, eg this Strategy **does not apply or applies in part** to *OSSM* facilities designed to cater for *sewage* generated from:

1. more than one domestic household (single dual occupancy are embraced by this strategy); or
2. a system catering for more than 2,500 equivalent persons (EP); or
3. a system producing more than 750 KL per day.

Such systems may require a formal application to, and approval from, the Department of Environment and Conservation (*DEC*), prior to a separate application to *Council*, accompanied by a copy of the *DEC* approval, to enable *Council*'s assessment and inspection of plumbing and drainage works.

9. APPROVAL REQUIRED TO INSTALL / CONSTRUCT / ALTER A SEWAGE MANAGEMENT SYSTEM

Council is empowered under S68 of the Local Government Act 1993 to require the submission of applications for the installation of all proposed *OSSM* systems (including alterations to existing *OSSM* systems).

Council will consider all applications based on the merits of the proposed system and the potential impact of the proposed system on human health and the *environment* as a whole.

Compliance with the provisions of the Strategy will not necessarily imply that *Council* will grant consent to an application or permit certain activities to prevail in terms of the ongoing operation of a system but will give consideration to the merit of an application in the individual case.

For any new installations, an application shall be made on the prescribed form, (refer to Appendix 2) accompanied by details as prescribed in Section 12 of this Strategy and any associated fees as prescribed in *Council*'s Revenue Strategy. Existing installations shall be subject to the same requirements as for new system installations where an owner chooses to alter or construct a system or where an alteration or modification is required due to inspections carried out by the *Council*, proposed alterations to the site or unsatisfactory performance of the system.

10. PERFORMANCE CRITERIA

The *Council* must consider performance criteria when determining applications for Approval to Install, construct, alter or operate on-site sewage management facilities. *The Local Government (General) Regulation 2005* {S.44(1)} specifies minimum objectives, which are listed below:

- a) *the prevention of the spread of disease by micro-organisms;*
- b) *the prevention of the spread of foul odours;*
- c) *the prevention of the contamination of water;*
- d) *the prevention of the degradation of soil and vegetation;*
- e) *the discouragement of insects and vermin;*
- f) *ensuring that persons do not come into contact with untreated sewage or effluent in the ordinary activities on the premises concerned;*
- g) *the minimisation of adverse impacts on the amenity of the premises and surrounding lands; and*
- h) *if appropriate, provision for the reuse of resources including nutrients, organic matter and water⁶.*

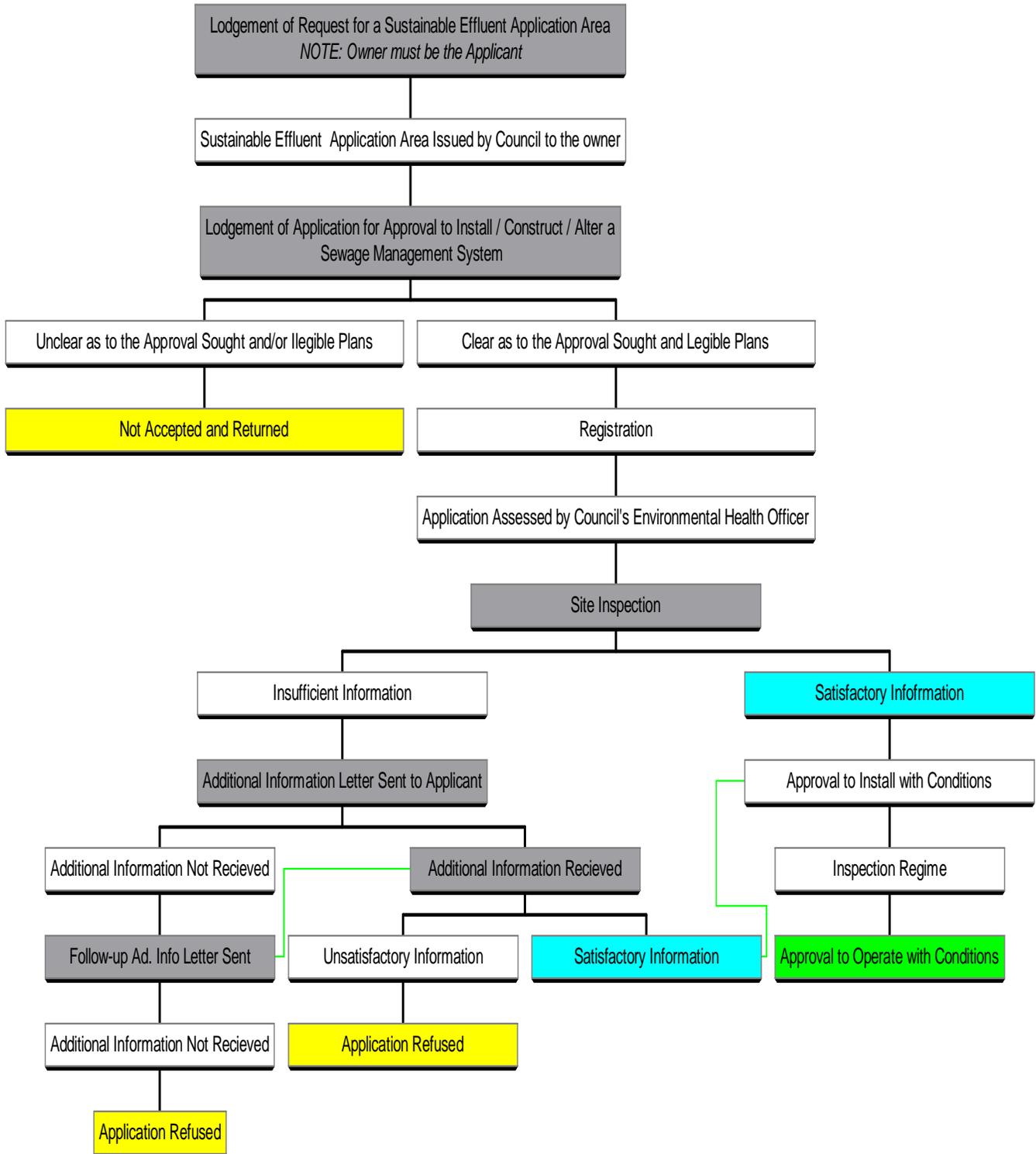
11. THE APPROVAL TO INSTALL / CONSTRUCT / ALTER A SEWAGE MANAGEMENT SYSTEM PROCESS

Prior to the submission of an Application to Install/Construct/Alter a Sewage Management System the owner of the allotment is required to obtain from *Council* the *sustainable effluent application area* required for their site. This information is obtained through *Council* by submitting a Request for a Sustainable Effluent Application Area (Appendix 3).

The flow chart on the following page and explanation should be used as a guide to the Approval to Install process and how an application should proceed in order to stay within the requirements of the relevant legislation:

⁶ Local Government (General) Regulation NSW 2005, S44(1)

Figure 2. Application to Install a Sewage Management System Flow-chart



12. MATTERS TO ACCOMPANY AN APPLICATION TO INSTALL, CONSTRUCT OR ALTER A SEWAGE MANAGEMENT SYSTEM

An application for Approval to Install, Construct or Alter a Sewage Management System on any premises must be accompanied by the documents specified below.

12.1 Site Plan

The application must be accompanied by a minimum of three (3) copies of a plan drawn to scale with accurate dimensions (refer to Appendix 4 for sample site plans), showing:

- a) *the location of the sewage management system proposed to be installed or constructed on the premises* including accurate measurements to **all** buildings and structures, boundaries, natural features including dams, waterways, creeklines, drainage depressions (located both within and external to the property, within the range of the required *buffer distances*), and native vegetation; **and**
- b) the precise location of *any related effluent application areas* and its relationship to all of those features listed above; **and**
- c) an irrigation plan detailing how even distribution of wastewater is to be achieved within the *related effluent application area(s)*; **and**
- d) *any buildings or facilities existing on, any land located within 100 metres of the sewage management facility or effluent application areas*; **and**
- e) location of any proposed structures that will impact on the performance of the irrigation or disposal system e.g. swimming pools, tennis courts, large sheds; **and**
- f) *the location of any environmentally sensitive areas of any land located within 100 metres of the sewage management system or effluent application areas*; **and**
- g) *any related drainage lines or pipework*⁷ (whether natural or constructed); **and**
- h) slope of the site (or contours at 0.5m (RL) intervals across the site where requested by *Council*); **and**
- i) all related *buffer distances* (refer to Table 3 and Section 21.2 of this Strategy).

12.2 Specifications

The application must be accompanied by a minimum of three (3) copies of the full NSW Department of Health accredited specifications of the sewage management facility proposed to be installed or constructed on the premises together with specifications of the proposed effluent application system(s).

⁷ Local Government General Regulation 2005 {section 26(2)}

12.3 Site Assessment

The application must be accompanied by details of the topography, soil composition and vegetation of any effluent application areas related to the sewage management system, as detailed on the rear side of the application form.

12.4 Statement

The details provided with any application submitted must include the following information:

- a) *the number of persons residing, or probable number of persons capable of residing, on the premises*⁸; **and**
- b) the number of bedrooms contained within the dwelling and any other habitable rooms that may be used or converted for use as sleeping accommodation that will lead to an increased occupancy over the total premises; **and**
- c) the nature of building(s) to be served by the system including any structures or buildings on the premises: **and**
- d) The type and number of fittings proposed to be connected to the system; **and**
- e) The source of water supply; **and**
- f) The principal use of the land upon which the system is to be installed; **and**
- g) such other factors as are relevant to the capacity of the proposed sewage management system.

12.5 Operation and Maintenance. (Required for AWTS)

The applicant is required to provide, in writing to *Council* prior to installation of the approved system the following details:

- a) *the operation and maintenance requirements for the proposed sewage management facility;* **and**
- b) *the proposed operation, maintenance and servicing arrangements intended to meet those requirements;* **and**
- c) *the action to be taken in the event of a breakdown in, or other interference with, its operation*⁹.

^{8,9} Local Government (General) Regulation 2005 (Section 26)

12.6 Wastewater/Geotechnical Report

Where the installation of a system of sewage management is proposed to be installed on an allotment having specific existing site constraints which render the site incapable of complying with the *sustainable effluent application areas* provided by *Council* it will be necessary to provide a detailed wastewater report prepared by a suitably qualified geotechnical consultant with justification of the proposal given the reduced area to achieve the desired objectives and performance criteria of this Strategy.

12.7 Approval to Operate

A completed application form for *Approval to Operate* a Sewage Management System (Appendix 6) must accompany the application for *Approval to Install* a Sewage Management System.

13. ASSESSMENT PROCESS

Where the information supplied with the application is inadequate, *Council* will write to the applicant and request further details. *Council* will not be held responsible for any delays in the approval process due to a failure on the part of an applicant to provide a satisfactory level of information. If the information supplied appears to be adequate, *Council* will undertake an inspection of the site in relation to the proposal. The site will be assessed in terms of its sensitivity and ability to cope with the proposed disposal of *effluent*. A copy of the site sensitivity assessment form can be found in Appendix 7.

The application will then be:

- a) **Approved** subject to conditions of consent and amendments where required, or
- b) **Refused** with an explanation if it is established that the proposal would not provide a satisfactory level of human health protection and environmental well being.

NOTE: An applicant or his/her contractor shall not commence work on the installation of a system of on-site sewage management without **prior written Approval** from *Council*, in the form of an *Approval to Install* a Sewage Management System.

14. OPERATION OF A SEWAGE MANAGEMENT SYSTEM

At the completion of an installation, construction or alteration of an onsite sewage management system, the system is not permitted to be operated until such time as *Council* has issued an *Approval to Operate* a Sewage Management System. This will only be issued once the system has been installed, constructed or altered in accordance with the approval as issued by the *Council*.

It is a condition of an approval to install, construct or alter a sewage management system that the facility is not used (or used as altered) until the Council has given the applicant for approval notice in writing that it is satisfied that the facility has been installed, constructed or altered in substantial accordance with the approval.¹⁰

¹⁰ Local Government (General) Regulation NSW 2005 S34

Council or the Certifying Authority shall not issue an Occupation Certificate under Section 109C (1c) of the Environmental Planning and Assessment Act (1979) for the occupation of the dwelling, building or other related structure until an Approval to Operate a Sewage Management Facility has been issued. It is an offence under Section 109M(1) of the Environmental Planning and Assessment Act (1979) to commence occupation of a new building (or part) unless an Occupation Certificate has been issued.

15. COMMERCIAL SYSTEMS

A Commercial Sewage Management Facility or a 'Package Wastewater Treatment Plant' can be described as any pre-fabricated or pre-engineered treatment system designed to accept and treat small to medium wastewater flows independent of a reticulated sewage system.

Any proposal not of a domestic nature, or expected to receive an equivalent daily wastewater volume between 10 EP and 2500 EP is typically regarded as a commercial sewage management facility, or a package wastewater treatment plant. If the applicant/proponent intends to install a commercial system, the application must be supported by all information as detailed in Appendix 8 of this Strategy. This will assist *Council* in the assessment and determination of the application.

Any commercial sewage management facility, or package wastewater treatment plant is required to be designed by a suitably qualified and experienced environmental engineer or wastewater consultant. The system must be certified in writing by the qualified environmental engineer or wastewater consultant based on both the design and performance parameters. The tank(s) must be certified in writing by a structural engineer. This certification must be provided as a supporting document to the Application to Install submitted to *Council*. The construction and installation of the system is required to be certified in writing by the installer, and must be provided in writing to *Council* prior to *Council* issuing an *Approval to Operate* for the system.

NOTE: In the interest of public health all commercial systems shall be fenced to prevent access from the public (fencing shall include lockable gates for maintenance access).

Commencement of works - An applicant or his/her contractor shall not commence work on the installation of a system of on-site sewage management without prior **written Approval** from *Council* in the form of an *Approval to Install* a Sewage Management System.

15.1 On site sewage management facilities > 10EP not accredited by the New South Wales Health Department

For domestic on site sewage management facilities which are not accredited by the New South Wales Health Department, with specific reference to *aerated wastewater treatment systems* designed to cater for greater than 10 people, the applicant shall engage a suitably experienced or suitably qualified wastewater consultant to provide the following information in addition to the information as required in section 12 of this strategy. This information must be included in the wastewater report submitted to *council* for approval.

15.1.1 Monitoring program

- (i) Detailing monthly water sampling, testing program aims, objectives, methodology of sampling and testing, stakeholders involved in the process and corrective action to be taken for failure to comply with the parameter criteria, including follow up sampling. Monitoring shall be undertaken at the point of discharge of *effluent* from the *septic tank* and/or treatment tank to the *related effluent application area*. The design of the system must incorporate a draw off point for samples to be taken.
- (ii) Detailing the parameters to be tested for as specified in Table 6. Expected Quality of Wastewater after Treatment in an *AWTS* by a NATA accredited laboratory.

NOTE: Monitoring for the prescribed parameters shall be undertaken at intervals as specified by *Council*. The monitoring regime will be reviewed annually by *Council* until such time as *Council* deems the systems to be in compliance with the prescribed criteria as specified in Table 6 and that the system is operating satisfactory without adversely impacting on the environment, public health and safety.

- (iii) *The information that is to accompany such applications (and applications for approval to alter a sewage management system) is to be determined by council in each particular case. Section 81 of the Local Government Act 1993 provides that an application for an approval under Part 1 of Chapter 7 of that Act (in which category such applications fall) must be accompanied by "such matters as may be prescribed by the regulations and such matters specified by the council as may be necessary to provide sufficient information to enable the council to determine the application"¹¹.*

16. MATTERS TO ACCOMPANY APPLICATIONS TO INSTALL, CONSTRUCT OR ALTER COMMERCIAL SEWAGE MANAGEMENT SYTSEMS

Council requires specific information to be supplied by the applicant to assist with the assessment and determination of any application for a Package Treatment Plant. This information is in addition to the information set out in Section 12 of this Strategy. Details regarding the information to be supplied by the applicant for a commercial onsite sewage management system can be found in Appendix 8.

¹¹ Local Government Act NSW, 1993

17. MATTERS TO CONSIDER – APPROVAL TO INSTALL / CONSTRUCT / ALTER A SEWAGE MANAGEMENT SYSTEM

17.1 Requirement for an On-Site Sewage Management Facility to be Accredited

Section 41 of the Local Government (General) Regulation 2005 requires that:

- (1) *The council will not approve the installation or construction of a sewage management facility unless the council is satisfied that the facility is to be installed or constructed to a design or plan that is the subject of a certificate of accreditation from the Director-General of the Department of Health, being a certificate that is in force.*
- (2) *Subclause (1) does not apply to or in respect of a sewage management facility:*
 - (a) *that is to be installed or constructed as a model for the purposes of testing,*
 - (b) *that is designed, and is to be constructed, by the owner or occupier of the premises on which it is to be installed, or*
 - (c) *that is specifically designed, by a person other than the owner or occupier of the premises on which it is to be installed, for those premises¹².*

17.2 Other Systems

Applicants wishing to install *on-site sewage management systems* that are not covered by this Strategy or who wish to install “one-off”/prototype, test model [as permitted by section 41(2)], a site-specific system due to site peculiarities or small commercial systems under 2,500EP but greater than 10EP will need to supply a wastewater report including all details of the system (as required by Section 12 and Sections 15 & 16 where relevant).

Council will consider the merits of each case to determine if development should proceed, or if an alternative method of *effluent* disposal can be employed.

17.3 Dual Occupancy

Any dual occupancy premises has the potential to be occupied by unrelated persons therefore posing health risks to other individuals. Accordingly, any proposal for a new or altered system for a dual occupancy premises, including both attached and detached post the adoption of this strategy shall comply with the following requirements:

- a) each dwelling shall have its own independent sewage management facility, including an independent designated *related effluent application area*; **and**
- b) *effluent* disposal (for any *AWTS*) shall be sub-surface irrigation, or fixed surface irrigation. Fixed surface irrigation area(s) must be fenced (including provisions for an access gate) to an appropriate standard to define the limits of the disposal area and to impede the unintended passage of persons.

NOTE: *Council* will assess each application based on its merits.

¹² Local Government (General) Regulation NSW 2005(S41)

17.4 Sizing of Effluent Application Areas

For all sites the minimum area permitted for the onsite disposal of *effluent* shall comply with the *sustainable effluent application areas* provided by *Council*.

NOTE: Consideration of a *reserve area* will need to be incorporated in to the design.

17.5 Reserve area

For all applications lodged with *Council* post the adoption of this Strategy:

1. *A reserve area of 100% of the design area shall be available on a site for expansion, for resting of the land-application system, or for a duplication of the land application system if unforeseen circumstances require this at some future time. The reserve area shall be protected from any development that would prevent it being used in the future.*¹³
2. Where an aerated wastewater treatment facility and fixed spray or drip irrigation is provided a minimum *reserve area* 50% of the design area shall be provided.

NOTE: For existing allotments prior to the adoption of this Strategy *Council* will assess each application based on its merits.

17.6 Flood Potential

1. 1% AEP (1:100) Flood Contours

All components of the onsite wastewater treatment facility (tanks) shall be located above the 1% AEP (1:100) flood contour (the tank shall be located on flood free land).

2. 5% AEP (1:20) Flood Contours

No portion of the *related effluent application area* (irrigation area or absorption or evapo-transpiration area) is permitted to be located below the 5% AEP (1:20) flood contour.

Where there is potential for the *related effluent application area* i.e. evapo-transpiration beds, irrigation areas etc. to be inundated by surface water *run-off* from roads or other properties, swales or bunding shall be constructed upslope of the application area to direct the water around such areas and shall be installed when so directed by *Council* so as to reduce the potential for contaminated water to leave the site.

NOTE: Where an existing system with existing site constraints is to be renewed on a premises that is flood affected all measures will be taken to protect the system and components from being inundated by flooding. Such systems are capable of being approved under the terms of this policy and will be assessed based on the merits of the situation.

¹³ Australian / New Zealand Standard 1547:2000, On-site domestic wastewater management (section 4.2.3.4)

17.7 Water Usage

In determining the estimated wastewater flow allowances for an *OSSM* facility the typical wastewater flow allowances detailed in Table 1 are to be used:

Table 1. Typical Domestic-Wastewater Flow Design Allowance

(Appendix 4.2D Page 141 AS/NZS 1547:2000)

Source	Typical wastewater flow allowance in L/person/day (see note 1)	
	On-site roof water tank supply	Reticulated community or a bore-water supply
Households with standard fixtures (including automatic washing machine)	140	180
Households with standard water reduction fixtures (see Note 2)	115	145
Households with full water-reduction facilities (see Note 3)	80	110
Households with extra wastewater producing facilities	170	220
Households (blackwater only)	50	60
Households (greywater only)	90	120
Motels/hotels		
• Guests, resident staff	140	180
• Non-resident staff	30	40
• Reception rooms	20	30
• Bar trade (per customer)	20	25
• Restaurant (per diner)	20	30
Community halls		
• Banqueting	20	30
• Meetings	10	15
Restaurants (per diner)		
• Dinner	20	30
• Lunch	15	25
Tea rooms (per customer)		
• Without restroom facilities	10	15
• With restroom facilities	15	25
School (pupils plus staff)	30	40
Rural factories, shopping centres	30	50
Camping grounds		
• Fully serviced	100	130
• Recreational areas	50	65
NOTES:		
1. These flows are minimum rates actual flows from past experience can be demonstrated.		
2. Standard water-conserving fixtures include dual flush 11/5.5 litre water closets, shower-flow restrictions, aerator faucets (taps) and water-conserving automatic washing machine.		
3. Full water-reduction fixtures included the combined use of reduces flush 6/3 litre water closets, shower-flow restrictors, aerator-faucets, front-load washing machines and flow/ pressure control valves on all water-use outlets. Additionally, water reduction may be achieved by treatment of greywater and recycling for water closet flushing (reclaimed water cycling.)		

17.8 Design Wastewater Flow Allowances

To ensure adequate treatment capacity of the proposed treatment system the following design wastewater flow allowances are to apply, unless otherwise stated by *Council*.

i. Residential development number of people (equivalent persons):

For residential development the design daily flow calculations shall be based on the maximum occupancy of the dwelling, being the number of bedrooms plus 2. The flow rates to be applied for various water supply conditions are shown in Table 1. Typical Domestic – Wastewater Flow Design Allowance.

NOTE: *Council* maintains the discretion to classify study's and other rooms that have the potential to be used as sleeping rooms as bedrooms. *Council* will assess each application based on its merits.

ii. Non-residential development:

Non-residential design daily flow rates to be applied as shown in Table 1. Where the commercial development intends to incorporate food preparation or sale the system may need to be designed to incorporate the use of a dishwasher, a dishwasher allowance of 1550 litres per 100 persons per day¹⁴ shall be provided.

For development that does not appear in table 1 of 17.7 evidence must be supplied as to the proposed wastewater generation from the development at the time of application.

NOTE: The design of the commercial system may need to incorporate the installation of a grease trap. Sizing of the grease trap shall comply with the trade waste requirements detailed by *Sydney Water Corporation*.¹⁵

iii. Proposals that incorporate extra wastewater producing facilities:

The Australian / New Zealand Standard 1547:2000 On-site Domestic Wastewater management stipulates that any household with extra wastewater producing facilities shall be based on a wastewater flow allowance of 220 litres per person per day (for *reticulated water supply*).

All applications will be assessed on their merits and on a case-by-case basis. In circumstances where *Council* considers that the *sustainable effluent application areas* as provided by *Council*, and the design of the system to be inappropriate *Council* may request additional information to be submitted to support the application.

¹⁴ NSW Department of Health – Septic tank and Collection Well Accreditation Guideline

¹⁵ Sydney Water – Managing trade wastewater in the food service industry

17.9 Sizing of Septic Tanks & Collection Wells

Sizing of *septic tanks & collection wells* shall be based on the following formula:

$$\begin{array}{r} \mathbf{S} \\ \text{(Sludge Allowance)} \end{array} + \begin{array}{r} \mathbf{(DF \times N)} \\ \text{(Daily Flow \times Number of Persons)} \end{array} = \mathbf{Tank Capacity}^{16}$$

NOTE:

1. A minimum of 1550 Litres is to be provided as a *sludge* allowance when sizing *septic tanks* for domestic premises. Premises with commercial cooking facilities shall adopt a minimum *sludge* allowance of 1820 Litres, or 2730 Litres in the case of hospitals¹⁷.
2. Daily flow allowances shall be taken from table 1.
3. Number of persons shall comply with the requirements of section 17.8 of this Strategy.

Where the daily flow allowances are not provided in Table 1 further advice shall be sought from *Council* regarding appropriate flow allowances to be used.

18. APPROVAL REQUIRED TO OPERATE A SEWAGE MANAGEMENT SYSTEM

18.1 Approval Required To Operate A System of Sewage Management

The operation of a system of sewage management shall take its meaning from Subdivision 6 Section 42 of *The Local Government (General) Regulation 2005*.

On and after the 6 April 1998, any new system of on-site sewage management installed in the Camden *LGA* must not be operated unless:

- a) an application is made to *Council* on the appropriate form for Approval to Operate a Sewage Management System (Appendix 6). The *Approval to Operate* expires on an annual basis and fees for the renewal of the *Approval to Operate* are attached to the annual rates notice for the property. Payment of the annual fee automatically renews the *Approval to Operate* (unless revoked by *Council*); and
- b) the nominated operator of the *on-site sewage management system* has received in writing from *Council Approval to Operate a System of Sewage Management* as installed for the period prescribed on the approval.

From the 1 July 1999, any existing system of *sewage* management within the Camden *LGA* is operating illegally unless:

- a) an application is made to *Council* on the appropriate form for Approval to Operate a System of Sewage Management accompanied by the associated fees as prescribed in *Council's* Revenue Strategy; and

¹⁶ NSW Health Department – Septic tank and Collection Well Accreditation Guideline, December 2001

¹⁷ NSW Health Department – Septic tank and Collection Well Accreditation Guideline, December 2001

- b) the nominated operator of the *sewage management facility* has received in writing from Council, Approval to Operate a System of Sewage Management as installed for the period prescribed on the approval.

18.2 Renewal of an Approval to Operate

Special provision under Section 107A of Local Government Act 1993 - renewal of approvals relating to operation of sewage management systems.

- a) *This section applies to an Approval to Operate a system of sewage management.*
- b) *The Council may by notice in writing (in any form determined by the Council) invite any person to whom an approval to which this section applies has been granted to apply to renew the approval.*

Note: For example, an invitation in writing to a person to renew an approval could be made in the form of an account or invoice.

- c) *A person to whom such an invitation is made is taken to have made an application under section 107 to renew the approval on the same terms as the original approval if the person pays any required application fee (being an approved fee under section 80).¹⁸*

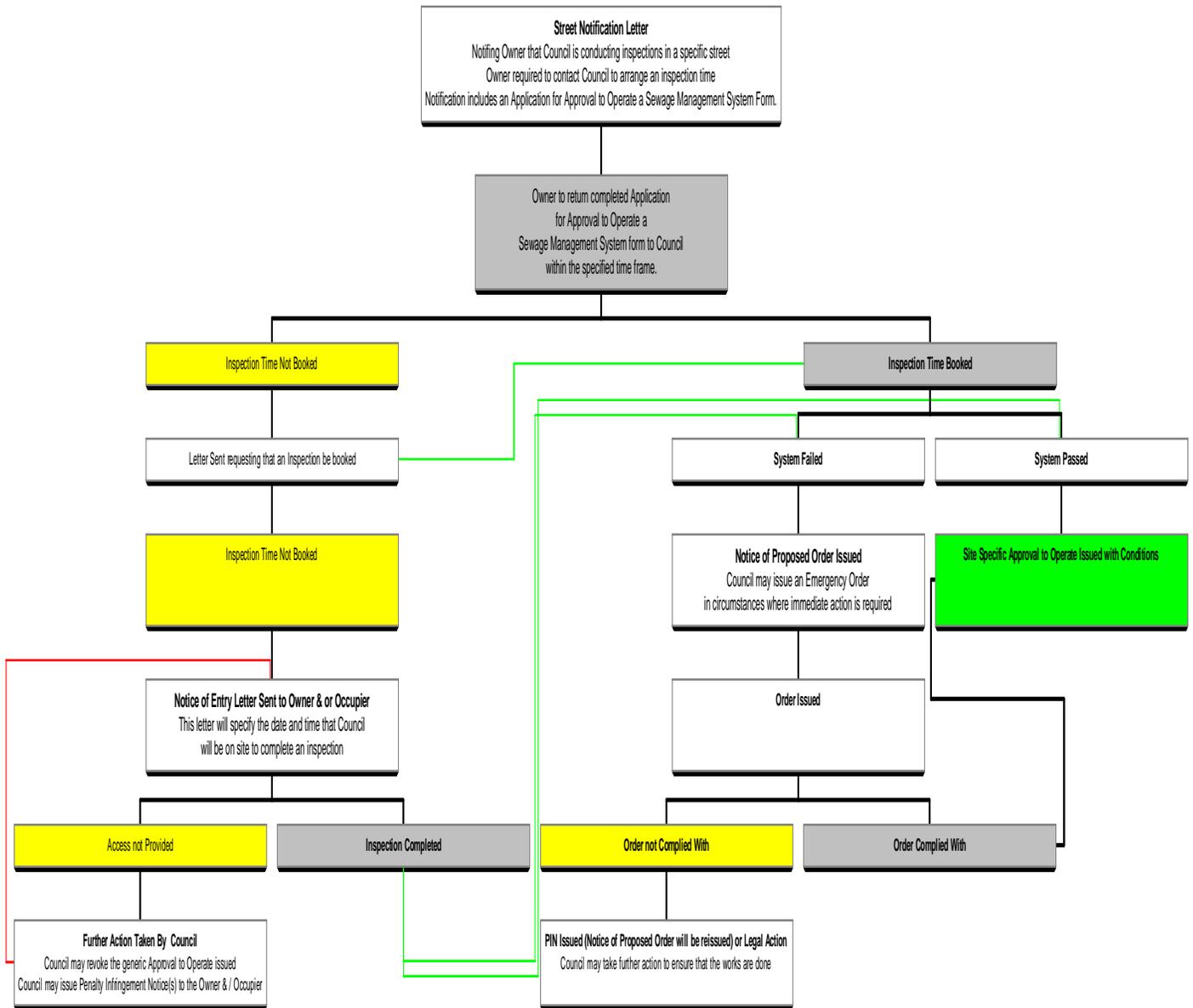
Note: The *Approval to Operate* a System of Sewage Management is issued to the owner of the property not the property itself. New owners, either by acquisition of established premises or installation of new systems are therefore required to submit an Application for Approval to Operate a System of Sewage Management to *Council* (Appendix 6).

18.3 The Approval to Operate Process

The following flow chart and explanation should be used as a guide to the Approval to Operate a Sewage Management System process and includes the owners responsibilities in ensuring compliance with the requirements of the relevant legislation

¹⁸ Local Government Act 1993 – section 107A

Figure: 3 The Approval to Operate Process



NOTE: Alternative action may be taken in accordance with Section 7 of this Strategy.

18.4 Inspection Regime

Existing installations, which during the course of inspections carried out by *Council*, are found to be functioning in a manner that meets the performance criteria and not requiring alteration, will be given a risk classification. This classification will be made in relation to the performance of the unit, the condition of the unit, possible impacts on public health, water quality, soils, native flora and community amenity. A rating given from the risk assessment inspection will be:

1. For domestic systems the following inspection rating will apply:

- a. low (requiring reinspection in 6 years), or
- b. moderate (requiring reinspection in 4 years), or
- c. high (requiring reinspection in 2 years).

This risk assessment will determine the potential impacts and advise when reinspection will be required.

2. Commercial systems shall require an annual inspection and will be subject to an annual fee per system and an hourly inspection rate in accordance with *Councils* revenue policy.

NOTE: Additional inspections may be carried out at *Councils* discretion.

The approval will specify the *performance objectives* of the Regulation and provide a mechanism for accountability to the *Council* concerning compliance with basic requirements (conditions) aimed at the protection of public health and the environment.

All Approvals will be valid for 1 year. Automatic renewal of the approval is achieved upon payment of the rates notice for the premises as specified in section 18.1. The inspection regime of each system shall be determined by the site sensitivity inspection form completed at the time of the *Approval to Operate* inspection (*Approval to Operate* Inspection Form Appendix 9) conducted by *Council*.

18.5 Failing Systems

Where an onsite sewage management system is found to be functioning in a manner which *Council* deems to be unsatisfactory and is a risk to either or both the *environment* and or public health, *Council* will take appropriate action under relevant legislation to ensure that the issues with the system are rectified and to ensure that the system is operating in a satisfactory manner.

This action is irrespective of whether or not the system is being operated under a current *Approval to Operate*. If this is the case *Council* holds the authority to revoke the *Approval to Operate*.

19. OPERATION OF A SEWAGE MANAGEMENT SYSTEM

The Local Government (General) Amendment (Penalty Notice Offences) Regulation 2001, commenced on 1 February 2002. The Regulation enables *Council* to issue penalty notices for two existing offences under the Local Government Act 1993:

- a) operating a system of sewage management without prior *Council* approval {s.626(3)}¹⁹; and
- b) operating a system of sewage management otherwise than in accordance with the terms of an approval {s.627(3)}²⁰.

The *Local Government (General) Amendment (Penalty Notice Offences) Regulation 2001* prescribes:

1. A penalty of 3 penalty units (at the time of the adoption of this strategy) for operating a system of sewage management without prior Council approval.
2. A penalty of 3 penalty units (at the time of the adoption of this strategy) is prescribed for the offence of operating a system of sewage management otherwise than in accordance with the terms of Council approval.

NOTE: 1 penalty unit = \$110 at the time of the adoption of this strategy.

If *Council* finds that a condition of the *Approval to Operate* has not been complied with, *Council* may modify or revoke the approval, or require remedial works to be undertaken to ensure compliance.

19.1 Responsibility of the Owner or Occupier

It is the responsibility of the homeowner / occupier to ensure that the *OSSM* system on their property is maintained and operated in a manner which does not pose any risk to public health and or the environment. The owner and or occupier should be aware of the operation and maintenance requirements for their *OSSM* system and must ensure that the necessary service contracts are in place. The owner or occupier should notify *Council* if their *OSSM* system is failing and prior to arranging the necessary repairs or replacement of the system in compliance with *Council* requirements.

Written approval must be obtained from *Council* prior to commencing any modifications or alterations to the system.

¹⁹ Local Government Act NSW 1993, S626(3)

²⁰ Local Government Act NSW 1993, S627(3)

20. MATTERS TO CONSIDER IN THE OPERATION OF A SEWAGE MANAGEMENT SYSTEM

20.1 Maintenance of Septic Tanks

Septic tanks shall be *desludged* as required by an authorised human waste removal service, between three and five years of operation or use. *Desludging* is required when:

- a) *the scum layer is within 100mm of the bottom of the inlet square junction, or the sludge layer is within 200mm of the bottom of the outlet square junction,*
- b) *the sludge occupies the basic allowance (1550L) of the septic tank, or*
- c) *the total depth of sludge and scum is equal to one third of the depth of the tank²¹.*

The *desludging* procedure should ensure:

1. That sufficient water is introduced in to the tank after *desludging* to prevent the tank from being lifted by soil hydrostatic pressure.
2. Caution shall be taken during the *desludging* process to protect the facility the collapse or displacement of internal compartments or components.

Grease Traps are not required to be installed with any new *domestic wastewater* treatment system (excluding grey water treatment systems). Existing grease traps shall be cleaned on a three (3) monthly basis to avoid deterioration of the *absorption* qualities of the transpiration area and prevent odour and blockages.

20.2 AAA Water Saving/Low Flow Devices

The National Water Conservation Labelling Scheme indicates that the average family can save approximately 50 KL per year, by adopting to install AAA water saving devices. Where any on-site sewage management facility is utilized, the following can be installed to reduce water consumption and assist in the prevention of the failure of the effluent disposal systems:

- a) Flow control devices are to be installed as an in-line fitting or as an end of line fitting at the following locations:

(i)	Basin	Hot and Cold	6 litres/minute
(ii)	Kitchen sink	Hot and Cold	9 litres/minute
(iii)	Laundry Tub	Hot and Cold	12 litres/minute
(iv)	Shower	Hot and Cold	9 to 12 litres/minute
(v)	Cistern		5 litres/minute;
- b) The installation of a 6 Litres per minute shower rose;
- c) The installation of dual flush 3/6 litre pan and cistern;
- d) The installation of a AAA rated water saving dishwasher (not more than 18 Litres for each wash cycle);

²¹ Environment & Health Protection Guidelines, On-site Sewage Management for Single Households

- e) The installation of AAA rated water saving washing machine (not more than 22 litres per dry kilogram of clothes).

20.3 AWTS Maintenance and Service Technicians

Aerated wastewater treatment systems (AWTS's) require regular servicing and maintenance. Field trial results have concluded that these systems need to be regularly serviced and maintained at 3-monthly intervals (or at intervals as specified in the NSW Department of Health Accreditation for the system).

a) Therefore:

- (i) the owner must enter into an Annual Service Contract with a Service Agent
 - (ii) The service agent is required to check or test all of the mechanical, electrical and functioning parts of the *AWTS* including:
 - the tank and connecting drainage is adequate;
 - electrical circuitry is adequate;
 - electrical wiring protected and satisfactorily installed;
 - the chlorinator (where installed);
 - UV lamp cleaned (where installed);
 - replenishment or replacement of *disinfection* agent (i.e. chlorine tablets, UV globe);
 - all pumps tested;
 - air blowers, fans or air venturi tested;
 - an alarm/buzzer or warning light test;
 - the effluent irrigation area is satisfactory;
 - the installed irrigation lines and sprinklers are satisfactory;
 - *sludge* and *scum* levels within the primary chambers, to determine if the system requires *pump-out* or no *scum* at all;
 - bacterial growth on all filter media;
 - the operation of the *sludge* return system;
 - *Residual chlorine* amounts;
 - clarity within the irrigation chamber adequate and noted;
 - *pH* of the irrigation chamber adequate and noted;
 - dissolved oxygen of the aeration chamber adequate and noted.
- b) At the completion of a service a report sheet should be completed. The service sheet shall be in the prescribed format as stipulated by *Council*. The report should be triplicate, the original to the owner or left on-site, the duplicate to *Council*, and the triplicate retained by the service agent for records.
- c) Where requirements dictate that an on-site sewage management facility is:
- (i) due to be serviced according to its operational guidelines;
 - (ii) in need of repair;
 - (iii) requiring replacement;
 - (iv) to be installed;
 - (v) to be altered, modified or attended to in terms of operational adjustment;

the said works may only be carried out by a person who is a qualified service technician or licensed tradesperson where required. Written approval must be obtained from *Council* prior to commencing any alterations or modifications to the system. Any replacement work must comply with the manufactures specifications and the NSW Department of Health Accreditation for the system.

- d) The service technician should have:
- (i) completed an appropriate course of instruction with an accredited college or similar body in the maintenance and operation of all sewage management systems; or
 - (ii) a minimum of two years experience in the maintenance and servicing of AWT systems; or
 - (iii) have demonstrated knowledge in the area of:
 - system design and treatment processes;
 - operation and maintenance requirements;
 - performance objectives for environment and health protection;
 - regulatory requirements and obligations;
 - consumer's rights;
 - occupational health & safety requirements;
 - service company to hold Public Liability Insurance;
 - service company to hold Professional Indemnity Insurance; and
 - understand environment protection responsibilities.
 - (iv) trade qualification as a plumber or drainer,
 - (v) relevant qualification of electrical circuitry.
- e) Servicing of any other system that would require specialist knowledge such as composting toilets, combustion toilets or the like shall only be carried out by the manufacturer or its authorised agent, unless satisfactory ability to do so is demonstrated.

21. SUPPORTING TECHNICAL CONSIDERATIONS

The following information is relevant and should be considered in both the Approval to Install a Sewage Management Facility and the Approval to Operate a Sewage Management Facility process.

21.1 Buffer Distances

Table 3. Buffer Distances (applicable to both domestic and non-domestic installations)

(Extracts are provided from Table 5 page 66 of The Environment and Health Protection Guidelines for On-Site Sewage Management for Single Households.)

SYSTEM	BUFFER DISTANCES – PRIMARY TREATED EFFLUENT FROM EXIT OF TANK	BUFFER DISTANCES – MINIMUM OF SECONDARY TREATED EFFLUENT FROM EXIT OF TANK
All land Application Systems	<ul style="list-style-type: none"> • 100 metres to permanent surface waters (river, stream, lake etc) • 250 metres to domestic groundwater well • 40 metres to other waters (farm dams, intermittent waterways and drainage channels) 	<ul style="list-style-type: none"> • 100 metres to permanent surface waters (river, stream, lake etc) • 250 metres to domestic groundwater well • 40 metres to other waters (farm dams, intermittent waterways and drainage channels)
Surface Spray Irrigation	NOT APPLICABLE	<ul style="list-style-type: none"> • 6 metres if area up-gradient and 3 metres if area down-gradient of driveways and property boundaries, • 15 metres to dwellings, • 3 metres to paths and walkways, • 6 metres to swimming pools.
Surface Drip and Trickle irrigation	NOT APPLICABLE	<ul style="list-style-type: none"> • 6 metres if area up-gradient and 3 metres if area down-gradient of swimming pools, property boundaries, driveways and buildings
Sub-surface Irrigation	NOT APPLICABLE	<ul style="list-style-type: none"> • 6 metres if area up-gradient and 3 metres if area down-gradient of swimming pools, property boundaries, driveways and buildings
Absorption or Evapo-transpiration or Mound system	<ul style="list-style-type: none"> • 12 metres if area up-gradient and 6 metres if area down-gradient of property boundary, • 6 metres if area up-gradient and 3 metres if area down-gradient of swimming pools, driveways and buildings 	<ul style="list-style-type: none"> • 6 metres if area up-gradient and 3 metres if area down-gradient of swimming pools, property boundaries, driveways and buildings

21.2 Additional Buffer Distances

- a) Market gardens: - Any proposed new system or replacement system for a property that incorporates market gardens shall comply with the following:
- i. Surface irrigation: a minimum *buffer distance* of 40 metres shall be provided between the proposed *related effluent application area* and any market garden.
 - ii. Sub-Surface irrigation: a minimum *buffer distance* of 20 metres if disposal area is up-gradient and 10 metres if disposal area is down-gradient of any market garden.
 - iii. The *related effluent application area* is required to be fenced.
 - iv. Fruit and / or Vegetables are not to be grown on top of or within the designated *related effluent application area(s)* and associated buffer zones.

NOTE: As an alternative for a premises with existing market gardens and an on-site sewage management system which requires upgrading or replacement *Council* may consider the installation of a pump-out system. In this instance the dwelling will need to be provided with a separate water meter.

- b) *Septic Tanks & Treatment Tanks*,
- i. A minimum *buffer distance* of 5 metres shall be provided between any septic and or treatment tank(s) and any property boundary
 - ii. The septic and or treatment tanks must be located a minimum of 2.5 metres from any dwelling, habitable building or other structure NOTE: This figure is based on the assumption that the installation will be in clay soils where the angle of repose is 45° , i.e. the base of the tank is equal to the distance to the base of the footings of the dwelling.
 - iii. The location of the tank(s) are required to comply with the *buffer distances* as detailed in Table 3 for permanent surface waters, *groundwater* wells and other waters.
 - iv. The location of the tank(s) shall be located a minimum of 6 metres down slope of any in-ground water storage tank.
 - v. The location of the tanks shall be a minimum of 6 metres from any market garden.

21.3 Vegetation

The cultivation of vegetation to utilise introduced *effluent* is an important ingredient in site management along with *effluent* quality, hydraulic capacity, soil quality and climatic conditions.

Vegetation selection is an important ingredient in terms of its ability to remove *nutrients* from the irrigation area and to be able to exist in the potentially high nutrient *environment* as a sustainable species. Ideally, vegetation selections should utilise local gene pool species-plants and shrubs. Refer to Appendix 10 – Vegetation suitable for land application areas.

21.4 Maintenance of REAA

It is the responsibility of the owner or occupier (where the premises is tenanted) to ensure that the *REAA* is maintained. Maintenance of the *REAA* shall ensure:

1. Grazing animals are not permitted to enter the irrigation site due to the potential for these animals to damage the *REAA*;
2. Grassed areas are to be regularly mowed, and maintained to a length of 75mm to aid in *Evapo-transpiration*;
3. Grass clippings are removed from the *related effluent application area*;
4. A stormwater diversion drain around the topside of the application area is provided to divert surface water;
5. The *REAA* is kept level by filling any depressions with good quality top soil (not clay);
6. *AWTS* - appropriate warning signs are visible at all times in the vicinity of the *REAA*
7. *AWTS* – Sprinklers should be operational at all times.

21.5 Treatment Systems

Various methods of on-site sewage management are able to be considered for approval including:

- a) Septic and *greywater* collection wells with absorption trenches, evapo-transpiration beds (T/beds) or mounds.
- b) *Aerated wastewater treatment systems (AWTS)*;
- c) Wet Composting Toilets;

- d) Waterless Composting Toilets;
- e) Greywater Diversion Devices;
- f) Domestic Greywater Treatment Systems;
- g) Artificially Constructed Wetlands;
- h) Sand filters;
- i) Peat Biofilters;
- j) *Waste Treatment Devices* that mechanically comminute or macerate and discharge *sewage* to a reticulated *sewerage* system; and
- k) **Pump-out Systems** - *Council* will consider all systems on their merits and in particular the ability of the system to minimise the potential for environmental damage or degradation. *Pump-out* systems are not considered to be a viable on-site waste management technique and as such will be considered as the last option and generally on existing sites where existing site constraints or environmental or health risks preclude other options.

21.6 Related Effluent Application Areas (REAA's)

Related Effluent Application Areas broadly fall into two main categories:

- a) irrigation systems;
 - (i) surface spray;
 - (ii) surface drip; and
 - (iii) sub-surface.
- b) soil *absorption* systems;
 - (i) evapo-transpiration beds; and
 - (ii) absorption trenches; and
 - (iii) mounds.

Wastewater requires various levels of treatment, depending on the method of application and the sensitivity of the site. Wastewater applied to the ground must be adequately treated so as to comply with the *buffer distances* set out in 'The Environment and Health Protection Guidelines for On-site Sewage Management for Single Households', these *buffer distances* are found in table 3 of this Sewage Management Strategy.

Land application areas for either above or below ground application shall be designed in accordance "The Environment and Health Protection Guidelines for On-Site Sewage Management for Single Households" and Sections 4.2A and 4.2B of AS/NZS 1547:2000 On-site Domestic Wastewater Management.

21.7 Design Requirements for Related Effluent Application Areas - Evaluation Criteria

The basic principle in evaluating a site is to initially identify the area available for *effluent* application and whether on-site *effluent* disposal may pose a potential risk to either health or the environment;

- a) for all sites, the minimum area permitted for land application of *effluent* from an **AWTS** is to comply with the *sustainable effluent application areas* provided by *Council*. Irrigation areas shall be fixed surface spray or sub-surface and will be restricted to within a designated *related effluent application area*;

Where an **existing** allotment having specific existing site constraints which render the site incapable of complying with the *sustainable effluent application areas* provided by *Council*, *Council* may consider a variation of this requirement, however it will be necessary to provide a wastewater report (in accordance with Section 21.7 of this strategy) prepared by a qualified wastewater/geotechnical consultant that supports the intent of the proposal;

- b) for all sites, the minimum area permitted for land application of **primary treated effluent** must comply with the *sustainable related effluent application areas* provided by *Council*.

Where an **existing** allotment having specific existing site constraints which render the site incapable of complying with the *sustainable effluent application areas* provided by *Council*, *Council* may consider a variation of this requirement, however it will be necessary to provide a wastewater report (in accordance with Section 21.7 of this strategy) prepared by a qualified wastewater/geotechnical consultant that supports the intent of the proposal,

- c) for a proposal for subdivision where the *Sydney Water Corporation* sewer is not available, the minimum area permitted for the land application of *effluent* from a proposed onsite sewage management facility is to comply with the *sustainable effluent application areas* provided by *Council*, and shall be designed to cater for a minimum of a 4 bedroom dwelling;
- d) where a proposed subdivision includes an existing dwelling, the assessment will need to demonstrate that, the subdivision will not impact on the dwellings existing wastewater management system, or a suitable provision for satisfactory wastewater disposal has been made.

21.8 Wastewater Site Report -Details to be included

Where an **existing** allotment is not capable of complying with the *sustainable effluent application areas* provided by *Council*, a wastewater site report may be required. The report shall incorporate the following considerations:

a) Site Information;

- (i) Proposal,
- (ii) Site Area (m²),
- (iii) Water Supply and water conservation fixtures,
- (iv) Wastewater Quantity (litres/day).

b) Site Assessment/Regional Setting;

- (i) Geology,
- (ii) Site drainage - any *run-on* or seepage, drainage lines,
- (iii) Climate,
- (iv) Site Fill,
- (v) Flood Potential,
- (vi) Aspect of land application (N, S, E or W),
- (vii) Existing groundcover/vegetation,
- (viii) Proposed vegetation on application area,
- (ix) Site slope,
- (x) Depth to *groundwater*.

c) Soil Assessment (for each horizon in soil profile to 1.0m or bedrock);

- (i) Depth to bedrock or hardpan,
- (ii) Watertable (m),
- (iii) Colour, Texture and Structure,
- (iv) *Permeability* category (Long Term Acceptance Rates),
- (v) *pH* (CaCl₂),
- (vi) Bulk density (kg/m³),
- (vii) Electrical Conductivity EC (1:5) (dS/m),
- (viii) Exchangeable Sodium Percentage ESP,
- (ix) Cation Exchange Capacity CEC (cmol+/kg),
- (x) Phosphorus Sorption Index,
- (xi) Emerson Aggregate Test EAT (Dispersiveness).

Table 4. Determination of Soil Category

(Provided by table 4.1.1 page 59 of AS1547:2000). Soil Permeability should be based on soil texture and structure as described by Hazelton and Murphy 1992.

Soil Category	Soil Texture	Soil Structure	Indicative Permeability (K_{sat}) (m/d)	Indicative Drainage Class
1	Gravels and sands	Structureless (Massive)	>3.0	Rapidly Drained
2	Sandy loams	Weakly structured Massive	>3.0 1.4 - 3.0	Well Drained
3	Loams	High/moderate structured Weakly structured or massive	1.5 - 3.0 0.5 - 1.5	Moderately well Drained
4	Clay loams	High/Moderate structured Weakly structured Massive	0.5 - 1.5 1.2 - 0.5 0.06 - 0.12	Imperfectly Drained
5	Light clays	Strongly structured Moderately structured Weakly structured or massive	0.12 - 0.5 0.06 - 0.12 <0.06	Poorly Drained
6	Medium to heavy clays	Strongly structured Moderately structured Weakly structured or massive	0.06 - 0.5 <0.06 <0.06	Very poorly Drained

- d) A full justification as to why the proposed development is unable to satisfy the requirements of *Councils sustainable effluent application areas* and section 21.6 (b & c) of this Strategy and detail the alterations considered by the proponent in adopting the approach that a variation to the requirements of this strategy is warranted.
- e) The consultant shall provide a complete resume of qualifications and experience that substantiates his/her ability to be suitable to design and certify an alternative. The consultant shall provide details of Professional Indemnity Insurance held and the limitations of such insurance.
- f) Land Application Area Calculations;
- (i) Water balance,
 - (ii) Total Nitrogen/Total Phosphorus,
 - (iii) Salinity.

NOTE:

Total Nitrogen calculations are to be based on an expected quality of wastewater after treatment in an *AWTS* of 30mg/L.

Total Phosphorus calculations are to be based on an expected quality of wastewater after treatment in an *AWTS* of 12mg/L.

Council may consider the use of reduced levels of Total Nitrogen and Total Phosphorus; however the use of reduced figures must be supported by the following procedure:

- i. The Manufacturer or installer is to provide *Council* with a full list of the systems installed in the Camden Local Government Area (*LGA*) of the same manufacture without modification.
 - ii. *Council* will select at random 10 test sites from the list provided;
 - iii. Collection of a minimum of 10 test samples from NSW Department of Health Accredited systems of the same manufacture without modification within the Camden *LGA*;
 - iv. Samples are to be taken (from the pump chamber) by a qualified environmental scientist, service technician or equivalent. An Environmental Health Officer from Camden Council must be on site during the sample process;
 - v. The samples are to be tested at a NATA Accredited laboratory;
 - vi. In addition to testing for Total Nitrogen, Total Phosphorus the samples are to be tested for *BOD₅*, *suspended solids*, *thermotolerant coliforms* and free *residual chlorine* (where applicable). The results must demonstrate compliance with the NSW Department of Health Accreditation for the system.
 - vii. The testing is at the cost of the manufacturer, installer or applicant;
 - viii. The full test results are to be provided directly from the NATA Accredited laboratory to *Council*.
- g) Site Plan - The report must contain a site plan, drawn to scale and shall include all information as detailed in section 12.1
- h) Recommendations:
- (i) Discussion of options alternatives and recommended (if any).
 - (ii) Ongoing management and maintenance techniques

21.9 Site Features

When completing a wastewater site report, the calculations shall consider the average climatic conditions in Camden LGA detailed in Table 5 of this Strategy.

Table 5. Average Climatic Conditions in Camden LGA

Month	Mean Daily Max. Temp (°C)	Mean Daily Min. Temp (°C)	50th Percentile (median) Monthly Rainfall (mm)	Mean Rain Days (mm)	Monthly Crop Factor	Mean Monthly Evaporation (mm)
January	29.1	16.6	75.0	10.9	0.8	182.9
February	28.5	16.7	62.0	11.0	0.8	151.2
March	26.7	14.8	75.2	9.7	0.8	139.5
April	23.7	11.0	44.3	8.8	0.8	105.0
May	20.4	7.3	46.0	9.3	0.7	65.1
June	17.6	4.4	37.6	7.4	0.6	51.0
July	17.1	2.9	35.7	7.1	0.6	65.1
August	18.9	3.9	18.0	7.7	0.6	93.0
September	21.6	6.6	37.6	8.1	0.7	120.0
October	23.8	10.0	47.4	10.5	0.8	145.7
November	25.7	12.6	83.4	10.2	0.8	171.0
December	28.5	15.0	39.1	8.4	0.8	204.6
Total Average	23.5	10.2	50.1	9.1	N/A	124.6

SOURCE:

- a) *Mean Daily Minimum and Maximum Temperatures for each month, (Bureau of Meteorology -Camden Airport Site No. 068192).*
- b) *The 50th percentile (median) monthly rainfall and mean number of rainy days per month (Bureau of Meteorology-Camden Airport Site No. 068192).*
- c) *Mean Monthly Evaporation Rates in mm for each month (Bureau of Meteorology- Badgerys Creek, Site No. 067068).*
- d) *Monthly Crop Factor (Rural Lands Study, 1995)*

21.10 AWTS Irrigation Systems

Table 6. Expected Quality of Wastewater after Treatment in an AWTS

(The concentrations are provided by Table 14 page 92 of The Environment and Health Protection Guidelines for On-Site Sewage Management for Single Households.)

Parameter	Concentration	Failure Indicator
BOD (5day)	< 20 mg/L	> 50 mg/L
Suspended solids	< 30 mg/L	> 50 mg/L
Total Nitrogen	25-50 mg/L	not applicable
Total Phosphorus	10-15 mg/L	not applicable
Free Residual Chlorine	> 0.5 to < 2.0mg/L	< 0.5mg/L or >2.0 mg/L
Faecal coliforms Disinfected Effluent	< 30 cfu/100 mL	> 100cfu/100mL
Faecal coliforms Non-disinfected Effluent	Up to 10 ⁴ cfu/100mL	not applicable
Dissolved oxygen	> 2 mg/L	< 2 mg/l

Related effluent application areas including the buried irrigation lines, the shaping of the land surface and the inclusion of all vegetation shall be installed prior to the occupation of a newly constructed dwelling and within 1 month of the installation of the AWTS (tanks) for an existing dwelling.

The *related effluent application area* shall be installed as per the approved plans and specifications. No alteration to the irrigation equipment or an increase or decrease in prescribed available area to receive *effluent* is permitted without the prior written approval of *Council*.

Design and operation of the effluent application areas shall comply with the following:

- a) the minimum area allowed for land application of *AWTS effluent* for all sites is to comply with the *sustainable effluent application areas* provided by *Council*.
- b) the *related effluent application area* shall be fixed surface spray or sub-surface irrigation.
- c) *related effluent application areas* shall observe the *buffer distances* as prescribed in **Table 3 and Section 21.2** of this Strategy;
- d) The irrigation/ distribution line used must be lilac (P23)²² in colour or have a lilac line to indicate wastewater.²³
- e) a valve to control the distribution of *effluent* to the *related effluent application areas* shall be installed;

²² Australian Standards 2700S, Colour Standards for General Purposes (1996)

²³ Australian/New Zealand Standard AS/NZS 3500.1:2003, Plumbing and Drainage, Part 1: Water Services

- f) sprinklers used in irrigation areas shall be located so as to throw wastewater within the *related effluent application area* only and not direct any irrigation water beyond the confines of the designated irrigation area;

Sprinklers used shall produce a coarse droplet spray with no misting or aerosol, and shall have a maximum plume height in the order of 800mm above finished ground level. Sprinklers shall be durable, long wearing and installed in such a manner as to ensure that they are not easily damaged during maintenance of the irrigation field;

- g) Sprinklers and fixtures used should be lilac in colour (P23)²⁴ to indicate wastewater;
- h) distribution lines to the *related effluent application areas* will be spaced depending on site specifics, and within the fixed areas, shall be buried to a minimum depth of 100mm with no portion of the line exposed to minimise the possibility of damage;
- i) *related effluent application areas* shall include effective up-gradient drainage to divert stormwater runoff away from the REAA and tanks. Re-direction of stormwater shall not impact on adjoining properties.
- j) *related effluent application areas* shall carry warning signs to inform persons that recycled water is being used for irrigation. Warning signs shall comply with the provisions of AS/NZS 1547:2000 On-site domestic-wastewater management and with provisions of AS 1319;
- k) application areas shall be non-trafficable and are not to be used for active recreation;
- l) standard household taps and garden fittings are not suitable for use as irrigation equipment. All irrigation pipework and fittings must comply with AS-2698 *Plastic Pipes and fittings for irrigation and rural applications*;
- m) *effluent* must not be used to grow vegetables or fruit for human consumption.

Sub-surface irrigation air-flushing valves are to be located at the highest point and flush valves at the lowest point of each sub-surface zone and shall be contained within a durable protective housing with a lilac lid (P23)²⁵ to indicate wastewater. An inline filter of a minimum nominal size of one and a half inches (3.81 centimetres) must be installed to assist in the prevention of particles entering in to the drip lines.

Individual sub-surface irrigation zones shall be restricted to a maximum of 400m², any variations from this requirement are required to be supported by complete irrigation calculations to justify the sizing of the subsurface irrigation zones.

The drip line used for sub-surface irrigation must:

- a) have pressure compensating emitters
- b) be lilac in colour or have a lilac stripe to indicate wastewater

NOTE: drip lines should also contain an in built root inhibitor

^{24,25} Australian Standards 2700S, Colour Standards for General Purposes (1996)

21.11 Evapo-Transpiration Systems

An important variation to on-site sewage disposal is the evapo-transpiration areas. These systems rely on soil *absorption* and evaporation via the sun and transpiration via vegetation.

These systems are typically constructed in a bed of aggregate, rather than in deep *absorption* trenches. As with all *effluent* disposal systems, the uniform distribution of *effluent* is critical to the performance of the system.

The sizing of an evapo-transpiration area whether combined with an *absorption* system or not, **for primary treated effluent** must comply with the *sustainable effluent application areas* provided by *Council*.

The construction of evapo-transpiration systems allows for a range of variation in layout, however, figure 4 & 5 of this strategy and the diagram in Appendix 11 reveals a typical evapo-transpiration bed arrangement. Section 22.12 of this Strategy details the construction requirements for these systems.

Figure 4: Evapo-transpiration- absorption bed

Figure 4.5A6 page 152, AS/NZS 1547:2000

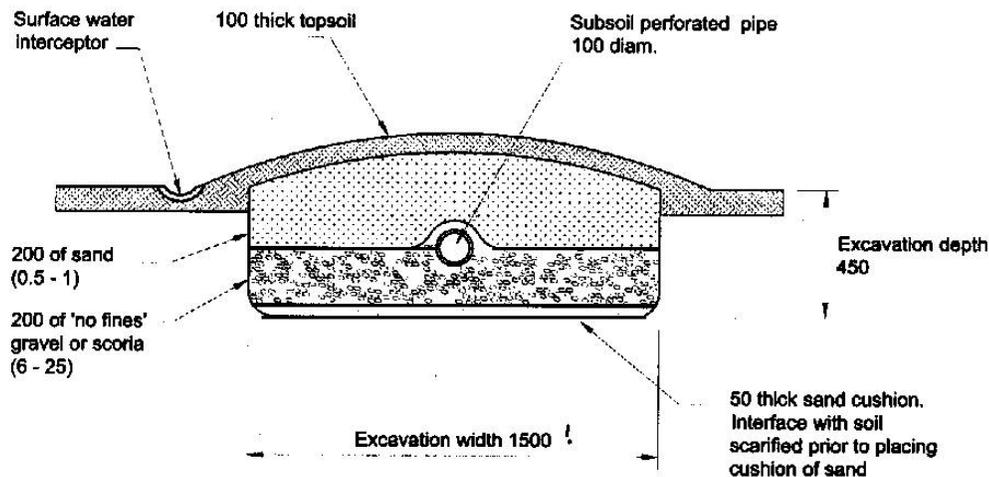


FIGURE 4.5A6 ETA/ETS BED DETAILS

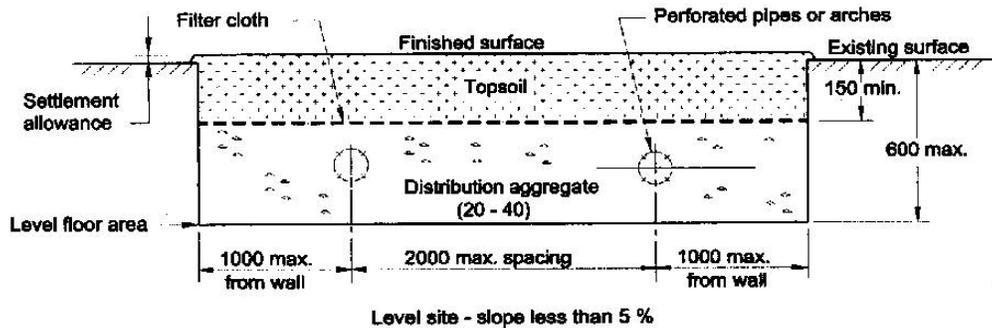
Figure 5: Conventional Bed*Figure 4.5A5 page 150, AS/NZS 1547:2000*

FIGURE 4.5A5 CONVENTIONAL BED

21.12 Construction of transpiration beds

Construction of transpiration beds shall ensure:

- a) that geo-textile fabric, not hessian is used to reduce root intrusion;
- b) that durable aggregate is used and is of a regular size, coarse aggregate with nominal sizes from 20mm to 40mm;
- c) that all effluent is discharged as close to the mid-point of the trench as possible;
- d) that individual trench lengths shall be limited to 20 metres;
- e) that where the required bed length is greater than 20 metres, the total bed length is to be divided into equal proportions. A distribution box is to be installed to ensure even flow to each bed;
- f) that individual beds are separated by not less than 1 metre (sidewall to sidewall);
- g) that all beds are located strictly parallel with the contours of the land, with the bottom of the beds as level as possible along their entire length. A dumpy or laser level should be used to ensure maximum longevity of the bed;
- h) that end capping be installed at the ends of the arch;
- i) reduce smearing or smoothing of bed surfaces and avoid compacting the soil;
- j) that sufficient backfill is left on top of the completed bed so as to allow for the settlement of the bed and thus avoiding a depression on top of the bed permitting ponding and infiltration of storm waters;
- k) vehicular traffic and stock shall be excluded from the bed area by fencing surrounding the area.

NOTE: These systems unless installed precisely have a high rate of failure

21.13 Absorption Trench Systems

Proposals will be considered entirely on their merits, however the soil types in the Camden LGA are generally not suitable for absorption trench systems.

21.14 Composting Toilets

There are generally two types of composting toilets:

- a) Waterless Composting Toilets; and
- b) Wet Composting Toilets.

With composting toilets there are a series of ways that they can be established in order to maximise the use of resources:

- a) wet composting toilets can be set up to receive all wastewater from the household or alternatively they can be set up with a Domestic Greywater Treatment System;
- b) any application for the installation of a composting toilet will need to be supported by installation and operational details from the manufacturer and installation company. The applicant will need to further demonstrate that they have a sound working knowledge of the system and that they will be able to satisfactorily maintain and operate the system
- c) Composting toilets and their design and manufacture are covered in terms of approval under the provisions of the *Local Government (General) Regulation 2005* and Australian Standard 1546:2000 by the NSW Health Department. In this regard, any composting toilet system installed will need to comply with this approval process;

Climate plays a significant role in the ongoing operation of composting toilets. Because the system relies on warmer temperatures to assist the rate of decomposition, users of these systems may need to select a larger system in order to fulfil their needs.

22. FEES & CHARGES

Council has adopted a fee schedule for cost recovery to cater for the implementation of the Strategy including inspections, education and administration. The fees for inspections and the approval have been determined in accordance with Section 608 regulatory fees the *Local Government Act 1993*.

NOTE. FEES ARE SUBJECT TO ANNUAL REVIEW BY COUNCIL.

23. AMENDMENTS AND VARIATIONS

An applicant may request a variation to any requirement in this Strategy provided the variation is agreed by *Council* to comply with the objectives of the Strategy.

Any request for a variation to a system of sewage management must be accompanied by full written documentation and shall include all necessary calculation and evidence as required by *Council* before any consideration can be given.

This Strategy is subject to review by *Council*. When an amendment takes place it shall be incorporated into the parent instrument and copies of the amendments placed after this page.

24. DEFINITIONS

Absorption

The absorption and/or uptake of effluent into the soil by capillary action²⁶.

AEP

Annual Exceedance Probability – The chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage, for example, a 1% AEP flood has a 1 in 100 chance of happening each and every year.

Aerated wastewater treatment facility (AWTS)

A wastewater treatment process typically involving:

- Settling of solids and flotation 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 in the wastewater

Anaerobic

Dissolved or free oxygen is not present in the wastewater

Anaerobic digestion

Decomposition of *sludge* in the absence of free oxygen

Approval to Install

For the Installation, construction or alteration of an on-site sewage management system, written approval to install, construct or alter a sewage management system must be obtained from Council prior to any works being undertaken. This is a requirement under the Local Government Act 1993 and the Local Government (General) Regulation 2005.

Approval to Operate

Approval required from Council to operate a system of sewage management. Operate a system of sewage management means to hold or process, or re-use or discharge, sewage or by-products of sewage (whether or not the sewage is generated on the premises on which the system of sewage management is operated) as defined under section 68 and 68A of the Local Government Act 1993.

Authority's Sewer (Sydney Water Corporation)

Centralised sewerage system, consisting of a sewage transport network, pumping stations, and treatment systems designed to service multiple users concurrently.

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

²⁶ AS/NZS 1547:2000, Onsite domestic wastewater management

Best management practice

Those approaches that have been developed to prevent or minimise water pollution at source, or as close to the source as practicable. They include those practices determined to be the most effective and practicable ways of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals

Biochemical oxygen demand (BOD₅)

A measure of the dissolved oxygen required for the breakdown of organic material in the *effluent*; usually refers to a 5-day test (*BOD₅*), which typically represents 70 - 80% of the total *BOD* in a sample; expressed in milligrams per litre (mg/L)

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*')

Buffer Distance

The distance that a wastewater treatment system must be situated from any habitable building, boundary, driveway, path, recreational facility, watercourse, body of water, Environmentally sensitive area or other feature as specified by *Council*.

Centralised sewerage system

The collection of all sewer and *sewerage* works. 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* re-use facilities
- *Effluent* discharge facilities

Compost

The material produced by the Aerobic biological decomposition of the organic Constituents of a material in which the original material cannot be identified and the composting process is complete.

Constructed wetland

Constructed area where the water surface is near ground level for enough of the year to maintain saturated soil conditions and promotes related vegetation

Council

For the purpose of this Strategy refers to "The Council of Camden".

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)

DEC

Department of Environment and Conservation {formerly known as the Environmental Protection Authority (EPA)}

Desludging

Removal of accumulated *sludge* and *scum* from the *septic tank* by a licensed contractor.

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

Drain

Drain for the carrying off of waters other than *sewage*.

Effluent

*The liquid discharged from a wastewater-treatment unit.*²⁷

Environment

*Surroundings, including natural and physical resources, community and neighbourhood relating to health, aesthetic, social, economic and cultural conditions*²⁸.

Environmentally sensitive area

Includes any land or area:

- (i) within 100 metres of a natural waterbody, wetland or coastal dune field, or
 - (ii) with a high watertable, or
 - (iii) with highly permeable soils or acid sulphate, sodic or saline soils, or
 - (iv) within a drinking water catchment, or
 - (v) within the water catchment area of an estuary where the entrance to the sea is intermittently open.
- (from the Local Government General Regulation 2005)

Equivalent population (EP)

A measure typically used in the design of wastewater management systems. Because there are differences in wastewater generation rates between premises with and without reticulated water supplies, and premises with dry composting toilet technologies, it is usually easier to stipulate design limits by an 'equivalent' number of people rather than the total flow.

^{27,28} AS/NZS 1547:2000, Onsite domestic wastewater management

Evapo-transpiration

Removing water from soil by evaporation and from plants by transpiration

Faecal coliforms (also known as thermotolerant coliforms)

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 (or Sullage)

*The domestic wastes from baths, showers, basins and laundries, specifically excluding water closets and urinal wastes. Greywater does not normally contain human waste unless laundry tubs or basins are used to rinse soiled clothing or babies napkins.*²⁹

Groundwater

All underground waters

Holding Tank

A tank used for holding *wastewater* prior to pumping out to REAA or removal by a authorised *waste* service (sometimes called a Collection Well)

Human excreta

Human faeces and urine

Human Waste

Means human faeces and urine (from the Local Government Act 1993)

Human waste storage facility (HWSF)

Device for holding or disposing of *human waste*, including a cesspit, chemical closet and pan toilet. (from the Local Government Act 1993)

Human waste treatment device (HWTD)

Device for treating *human excreta* and other

Wastewater, including a *septic tank*, *aerated wastewater treatment system*, septic closet, water closet, humus closet and combustion closet (from the Local Government Act 1993)

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)

Landform element

An area with a definable slope, topography, position, and land surface features. Landform elements typically have characteristic dimensions of greater than 40 metres and less than 600 metres diameter. Examples are hillcrests, footslopes, swales and levees. Seventy types of landform element are described in Speight, J G (1990)

LGA

Local Government Area

²⁹ AS/NZS 1547:2000, Onsite domestic wastewater management

Local authority

Examples are:

- Licence regulators in metropolitan areas
- Local Councils in country NSW
- Water boards established for specific locations

Nitrification

Transformation of inorganic ammonium (NH_4^+) into nitrate (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 encouraging nuisance growths of algae and aquatic plants in waters and (in the case of nitrate) posing a direct human health risk

On-site Sewage Management (OSSM) System

A system that stores and treats *wastewater* on-site (does not include the REAA)

On-site Sewage Management (OSSM) Facility

A system that stores, treats and disposes of wastewater incorporating both the tanks and REAA.

Operate an on-site sewage management facility

To hold, process, or reuse or otherwise dispose of *sewage* or by products of *sewage* as defined under section 42 of the Local Government (General) Regulation 2005.

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 on-site sewage management (partial on-site management)

The preliminary treatment of wastewater on-site, 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

Performance Objectives

*The outcomes that a system must attain in order to be acceptable.*³⁰

Permeability

The general term used to describe the rate of water movement through a soil

^{30, 31} AS/NZS 1547:2000, Onsite domestic wastewater management

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

Primary Treatment

*The separation of suspended material from wastewater by settlement and/or flotation in a septic tank prior to the effluent discharge to either a secondary treatment process or to a land application area.*³¹

Pump-out

A septic system where all accumulated wastewater is removed from site by an authorised waste service.

Recirculating aerobic sand filter device (RASFD)

(Intermittent sand filter) provides further treatment of pre-treated wastewater by *Percolation* through graded sand

Regulatory Authority

*An authority that is empowered by statute to be responsible for managing or controlling an aspect of on-site domestic-wastewater systems.*³²

Related Effluent Application Area (REAA)

An area of land specifically designated for the application of *effluent*.

Reserve Area

*An area set aside for future use as a REAA to replace or extend the original REAA.*³³

Residual chlorine

Chlorine remaining in solution after a specified period of contact between the 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

^{32,33} AS/NZS 1547:2000, Onsite domestic wastewater management

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, fixtures and appliances used to collect *wastewater* from household drains and convey it to the sanitary drainage system

Scum

The floating material that collects at the top of primary *wastewater* treatment tanks, including Oils, grease, soaps and plastics

Secondary Treatment

Aerobic biological processing and settling or filtering of *effluent* received from a *primary treatment* unit. *Effluent* quality following *secondary treatment* is expected to be equal to or better than 20mg/L 5-day *Biochemical oxygen demand* and 30mg/L *suspended solids*.

Septage

*The pumpout contents of a septic tank (or primary compartment of an AWTS) removed during desludging operations, which includes scum, sludge and tank liquid.*³⁴

Septic tank

*A single or multiple chambered tank through which wastewater is allowed to flow slowly to permit suspended matter to settle and be retained, so that organic matter retained therein can be decomposed (digested) by anaerobic bacterial action in the liquid. The term covers tanks used to treat all-waste, greywater or blackwater.*³⁵

Septic wastewater

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

Sewage

Waste matter that passes through sewers. *Sewage* includes any *effluent* of a kind referred to in the definition of *waste*.

Sewerage

*The network of collection drains carrying domestic wastewater or effluent away from properties for off-site treatment*³⁶.

Sewerage work

Means the construction, alteration, extension, disconnection, removal, ventilation, flushing, cleansing, maintenance, repair, renewal or clearing of any *sewerage* service pipes or fittings or fixtures communicating or intended to communicate, directly or indirectly, with:

- (a) a *septic tank*, an *effluent* or a *sullage* disposal system; or
- (b) any sewer of a *Council*,

and includes work of sanitary plumbing and work of house drainage.

Sewage management

Any activity carried out for the purpose of holding or processing, or reusing or otherwise disposing of, *sewage* or by-products of *sewage*.

Sewage management facility

Includes a human *waste* storage facility, or a *waste* treatment device intended to process *sewage*, and includes a drain connected to such a facility or device. (from the Local Government Approvals Regulation 1999)

Sludge

*The semi-liquid solids settled from wastewater.*³⁷

Soil absorption system

(includes leach drains, drain fields, *absorption* trenches, seepage beds and seepage pits) sub-surface land *application systems* that rely on the capacity of the soil to accept and transmit the applied hydraulic load

Split system

Wastewater management system in which a *septic tank* accepts *waste* directly from the toilet and kitchen, and *treated wastewater* is directed to a land application area. The remainders of the *wastes* are drained to another land application area through a *sullage* tank or *greywater* treatment system

Suspended solids (SS)

In wastewater analysis: solids retained after filtration through a glass fibre filter paper followed by washing and drying at 105oc, or by centrifuging followed by washing and removal of the supernatant liquid; expressed in milligrams per litre (mg/L)

Sustainable Effluent Application Area

The sustainable effluent application area is the area required for sustainable disposal of wastewater and is based on the soil landscapes (as defined by the 1:100 000 Penrith and Wollongong Soil Landscape Sheets produced by the Soil Conservation Service of NSW), soil facets, rainfall data and topography of the site, taking into consideration the proposed development of the site and the surrounding land uses. Sustainable effluent application areas are provided by Council to the owner of the premises upon request in compliance with the requirements of this Strategy.

Total on-site sewage management (total on-site management)

Treatment and use of all wastewater generated within a household, completely within the boundary of the premises

Treated wastewater (in these guidelines)

Wastewater that has received treatment via a *human waste* treatment device

Vectors

Insects or animals, such as flies, mosquitos or rodents, that are attracted to the putrescible organic material in wastewater and wastewater treatment systems, and that spread disease

^{37,39} AS/NZS 1547:2000, Onsite domestic wastewater management

Waste

means:

- a) *Effluent*, being any matter or thing, whether solid or liquid or a combination of solids and liquids, which is of a kind that may be removed from a *human waste* storage facility, *sullage* pit or grease trap, or from any *holding tank* or other container forming part of or used in connection with a *human waste* storage facility, *sullage* pit or grease trap, or
- b) *trade waste*, being any matter or thing, whether solid, gaseous or liquid or a combination of solids, gases and liquids (or any of them), which is of a kind that comprises refuse from any industrial, chemical, trade or business process or operation, including any building or demolition work, or
- c) *garbage*, being all refuse other than *trade waste* and *effluent*, and includes any other substance defined as *waste* for the purposes of the [Protection of the Environment Operations Act 1997](#), and a substance is not precluded from being *waste* merely because it is capable of being refined or recycled.

Wastewater

*The used water arising from domestic activities in dwellings, institutions or commercial facilities consisting of all-waste, greywater or blackwater.*³⁸

Waterless composting toilet

(humus closet, biological toilet) waterless system that uses the principle of composting to break down *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

25. REFERENCES**Brisbane City Council 1998,**

On-site Domestic Wastewater Treatment and Disposal Systems Strategy.

Bureau of Meteorology

Internet Web-site 2004, www.bom.gov.au, Climate Averages for Australia.

Council of Camden,

Draft Camden Rural Lands Study 1998.

Hazelton PA and Murphy BW (eds) 1992,

What do all the Numbers Mean? A Guide for the Interpretation of Soil Test Results, Department of Conservation and Land Management, Sydney.

Martens & Associates 2004,

Supply of Geotechnical and Hydrological Data – Suitability for On-site Wastewater Disposal / Reuse: Camden Local Government Area NSW.

NSW Government, Department of Local Government:

- a) Local Government Act (NSW) 1993.
- b) Local Government (General) Regulation (NSW) 2005
- c) Environmental Planning and Assessment Act (NSW) 1979
- d) Environment and Health Protection Guidelines: On-site Sewage Management for Single Households.
- e) Internet Web-site, www.dlg.nsw.gov.au, Septic Safe

Soil Conservation Service of NSW, 1:100 000 Penrith & Wollongong Soil Landscape Sheets**Standards Australia 1998, AS/NZS 1546-1998**

- a) Part 1: Septic tanks
- b) Part 2: Waterless Composting toilets
- c) Part 3: Aerated wastewater treatment systems

Standards Australia / Standards New Zealand 1996, AS 2700S

Colour Standards for General Purposes

Standards Australia / Standards New Zealand 2000, AS/NZS 1547:2000

On-site Domestic Wastewater management. Australia/New Zealand Standard

Standards Australia / Standards New Zealand 2003, AS/NZS 2698

Plastic Pipes & Fittings for Irrigation & Rural Application

Standards Australia / Standards New Zealand 2003, AS/NZS 3500

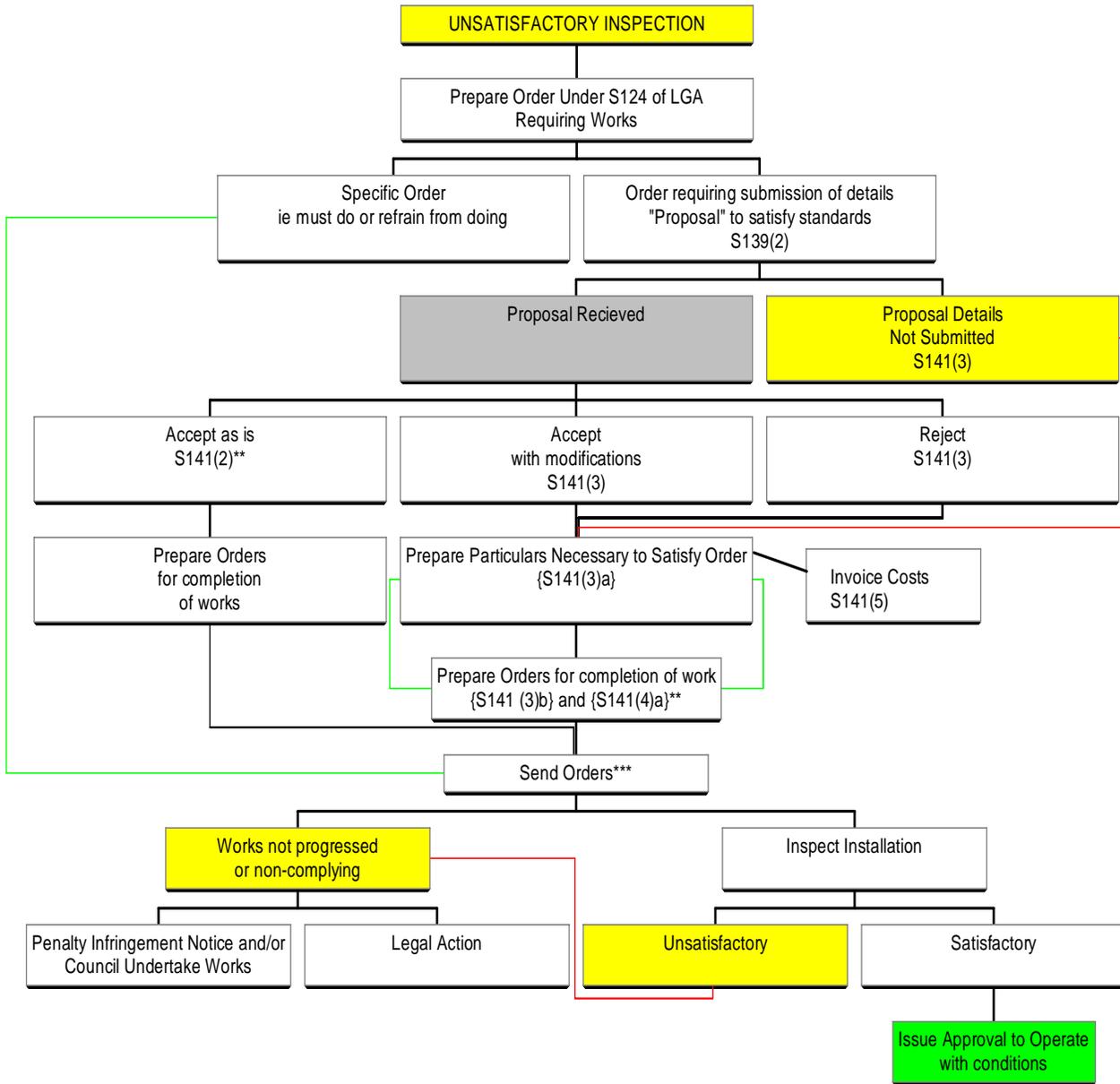
Plumbing and Drainage

Sydney Water Corporation, February 2003

Managing Trade Waste in the Food Service Industry

Appendix 1. Order Process

Proposal to Install / Construct / Alter a Sewage Management System



NOTE:

** S135(2) no further pre-order required where proposed order is to be modified

*** Period for compliance: 28 days from the date of written acceptance of proposal (unless otherwise stated by Council)

Prosecution Options

- failing to comply with conditions where exemption applies {S626(4)}
- not in accordance with approval {S626(3)}
- failing to comply with Order {S628(2)}

Appendix 2. Application Form for Approval to Install a Sewage Management System



CAMDEN COUNCIL
 37 John Street, Camden
 PO Box 183, Camden 2570
 Local Government Act, 1993

Date: _____
File No. _____
Registration No. _____

APPLICATION TO INSTALL/CONSTRUCT/ALTER A SEWAGE MANAGEMENT SYSTEM

I the undersigned hereby apply to the Council for Approval to Install, construct or alter a sewage management system on the undermentioned land in accordance with the plans (in triplicate) attached thereto. I undertake to have the work carried out by competent tradesmen in a workmanlike manner and in accordance with the Home Building Act 1989 and in accordance with the Water, Sewerage and Drainage Regulation, Local Government Act, 1993.

Name of Applicant: _____ Telephone: _____

Postal Address: _____

Signature of Applicant: _____

PROPERTY DETAILS:

Lot: _____ Section: _____ DP: _____ House No: _____

Street: _____

Name of Owner: _____ Telephone: _____

Address: _____

Signature of Owner: _____

Name of Plumber/Drainer: _____ Licence No: _____ Telephone: _____

Address: _____

Dimensions of Land: Area: _____ hectares / acres / m² (please circle)

Main Use of Land: Residential Agricultural Commercial Other (Specify) _____

Nature of Buildings / Facilities to be Connected:

New Single Dwelling Existing Single Dwelling Dual Occupancy Dwellings / 'Granny Flat'

Other facility (Specify) _____

Indicate number of type of waste fittings to be connected to the tank:

__Bath(s) __Shower(s) __Kitchen sink(s) __Toilet(s) __Basin(s) __Laundry __Other _____

Number of sleeping rooms to be served: _____ bedrooms

Number of persons to be served: _____ people

Nature of water supply: Town Mains Tank Capacity _____ (litres)

Distance from nearest watercourse: _____

Type of System: Aerated wastewater treatment system Conventional Other _____

Type of Related Effluent Application Area (REAA):

- Fixed Surface Irrigation
- Subsurface Irrigation
- Evapo-transpiration system
- Other

REAA's must comply with Camden Council's Sewage Management Strategy. A separate application for the Sustainable Effluent Application Area required for the site must be made to Council prior to the submission of this application.

Application for Approval to Operate Lodged: YES NO

MATTERS TO ACCOMPANY APPLICATIONS
FOR APPROVAL TO INSTALL, CONSTRUCT OR ALTER
SEWAGE MANAGEMENT SYSTEMS

Note: It is the statutory responsibility of the applicant to provide documents as specified overleaf to enable Council to determine the application.

Please indicate documents/information included with this Application.

Sustainable Effluent Application Area. The owner of the allotment has obtained the sustainable effluent application area required for the allotment from Council. A copy of the sustainable effluent application area required for the allotment is attached to this application.

Site Assessment. Details of the

- | | | | | |
|-------------|--------------------------|-------------|--------------------------|------------------------------------|
| topography: | <input type="checkbox"/> | Flat | <input type="checkbox"/> | Loams (Varying mix of sand & clay) |
| | <input type="checkbox"/> | Even Slope | <input type="checkbox"/> | Light Clay |
| | <input type="checkbox"/> | Undulating | <input type="checkbox"/> | Heavy Clay |
| | <input type="checkbox"/> | Steep Slope | <input type="checkbox"/> | Exposed Rocks |

- vegetation within any effluent application areas related to the sewage management system, together with an assessment of the site in the light of those details.

Site Plan. The application must be accompanied by a minimum of three (3) copies of a plan, to scale, showing the location of:

- the sewage management facility proposed to be installed or constructed on the premises, and
- any related effluent application areas (REAA), including reserve areas (dimensions of REAA(s) shall be displayed in metres), and
- demonstration of how even distribution of wastewater is to be achieved within the REAA (e.g. for an AWTS with fixed surface irrigation or subsurface drip irrigation the location of all sprinklers or driplines, valves, filters etc), and
- any buildings or facilities existing on any land located within 100 metres of the sewage management facility or effluent application areas, and
- any environmentally sensitive areas of any land located within 100 metres of the sewage management facility or effluent application areas, and
- any related drainage lines or pipe-work (whether natural or constructed, including an external drainage diagram).

Specifications. A minimum of three (3) copies of the full specifications of the sewage management facility proposed to be installed or constructed on the premises including the NSW Department of Health Accreditation Certificate for the system, together with details of the proposed effluent application system(s).

Operation and maintenance. (Required for AWTS) Details of:

- the operation and maintenance requirements for the proposed sewage management facility, and
- the proposed operation, maintenance and servicing arrangements intended to meet those requirements,
- the action to be taken in the event of a breakdown in, or other interference with, its operation.

Geotechnical Report – Should an **existing** allotment with specific existing site constraints not be capable of complying with the sustainable effluent application area for the allotment as detailed in the Sewage Management Strategy, the applicant is required submit a detailed wastewater report prepared by a qualified soil hydraulic consultant.

NOTE: The **information that is to accompany such applications** (and applications for approval to alter a sewage management facility) is to be determined by the council in each particular case. Section 81 of the Local Government Act 1993 provides that an application for an approval under Part 1 of Chapter 7 of that Act (in which category such applications fall) must be accompanied by “such matters as may be prescribed by the regulations and such matters specified by the Council as may be necessary to provide sufficient information to enable the Council to determine the application”.

Application for Approval to Operate – A completed Application for Approval to Operate a Sewage Management System form must be included with your application.

For Office Use Only

Application fee \$ _____ **Receipt No** _____ **Date** _____ **Job #.** 03850.1013.259

Includes: Assessment of Application for Approval to Install/Construct/Alter a Sewage Management System,
 3 x Inspections, and
 Approval to Operate a System of Sewage Management.

Note: Additional inspection fees may be charged where reinspection of works is required.

Appendix 3 Request for a Sustainable Effluent Application Area



CAMDEN COUNCIL
37 John Street, Camden
PO Box 183, Camden 2570
Local Government Act, 1993

Date: _____
File No. _____
Registration No. _____

REQUEST FOR A SUSTAINABLE EFFLUENT APPLICATION AREA

I the undersigned hereby apply to the Council for the sustainable effluent application area required for the proposed onsite sewage management system on the undermentioned land in accordance with the floor plans (in duplicate) attached thereto.

Name of Applicant (Owner): _____ Telephone: _____

Postal Address: _____

Signature of Applicant (Owner): _____
(NOTE: APPLICANT MUST BE OWNER)

PROPERTY DETAILS:

Lot: _____ Section: _____ DP: _____ House Number: _____

Street: _____ Suburb: _____ Postcode: _____

Nature of Buildings / Facilities to be Connected:

Number of sleeping rooms to be served: _____ bedrooms

Number of persons to be served: _____ people

NOTE: FLOOR PLAN (IN DUPLICATE) FOR THE PROPOSED OR EXISTING DWELLING AND OR ASSOCIATED BUILDINGS OR FACILITIES TO BE CONNECTED MUST BE ATTACHED TO THIS APPLCATION

Type of System:

- Aerated wastewater treatment system
Conventional
Other

Type of Related Effluent Application Area:

- Fixed surface irrigation
Subsurface drip irrigation
Evapo-transpiration system
Other

FOR OFFICE USE ONLY:

Floor plan attached to application

- Yes
No

NOTE: Proposed dwelling and On-site Sewage Management System are subject to a separate approval(s) from Council. This is not an approval and does not imply that consent will be given. Advice regarding the proposed development should be sought from Council's Development Branch.

Note: Request to be returned to Owner if Floor Plan (in duplicate) is not attached.

Number of potential sleeping rooms to be served _____, other facilities _____

Sustainable Effluent Application Area Required _____ m^2

Size of Reserve Area required _____

System Type: _____ Type of Disposal _____

Date forwarded to Owner _____ Council Officer _____

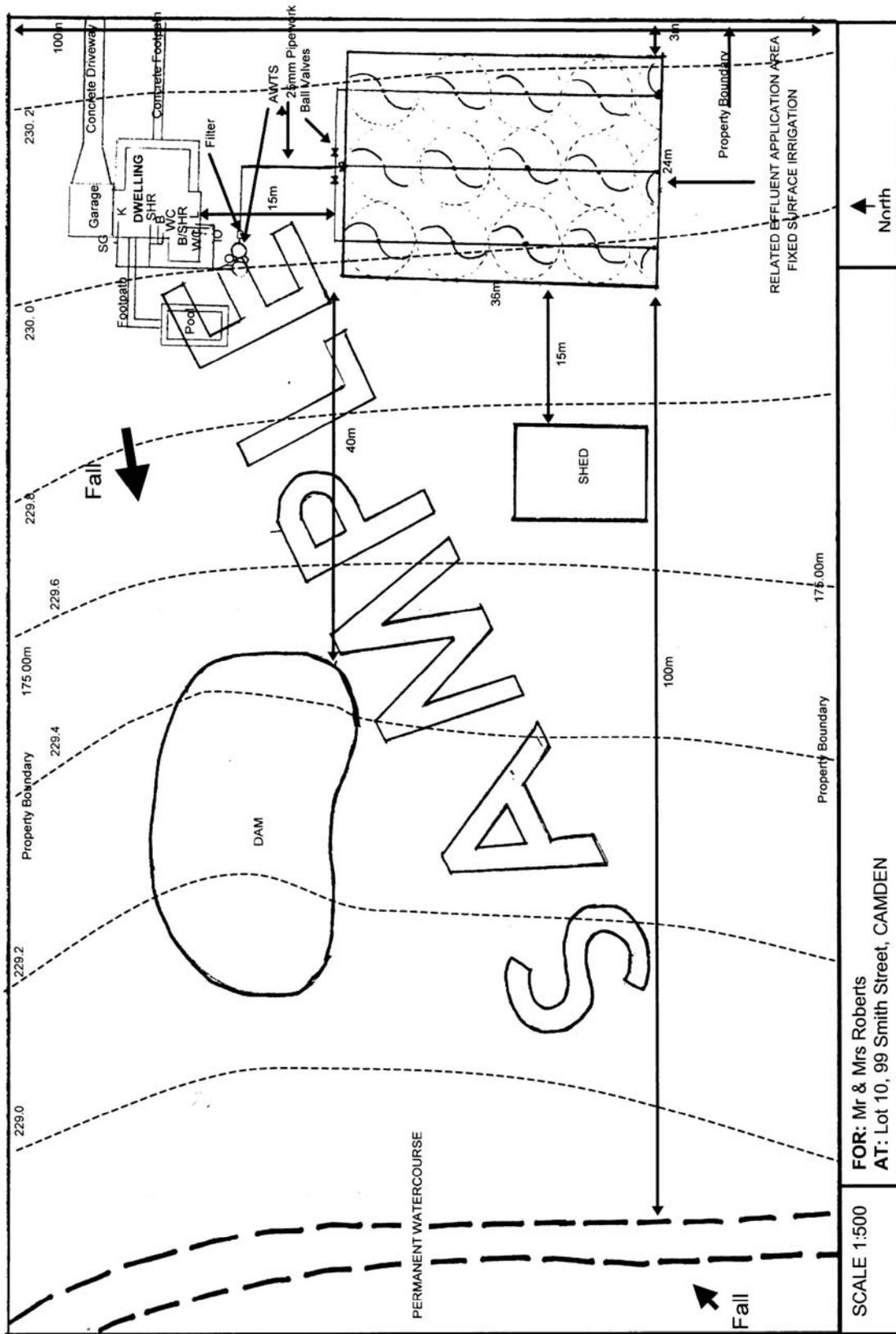
NOTE: The Sustainable Effluent Application Area provide on this form is calculated based on the soil classification (as defined by the 1:100 000 Penrith and Wollongong Soil Landscape Sheets produced by the Soil Conservation Service of NSW), soil facets, rainfall data and topography of the site. And includes specific reference to the floor plans and details submitted to Council with this request. Any changes to the plans and details submitted will render this information VOID. Council may request the submission of any additional information or amendments to support the application.

Appendix 4. Sample Site Plans

Site Plan 1: Fixed Surface Spray Irrigation

Site Plan 2: Sub-Surface Drip Irrigation

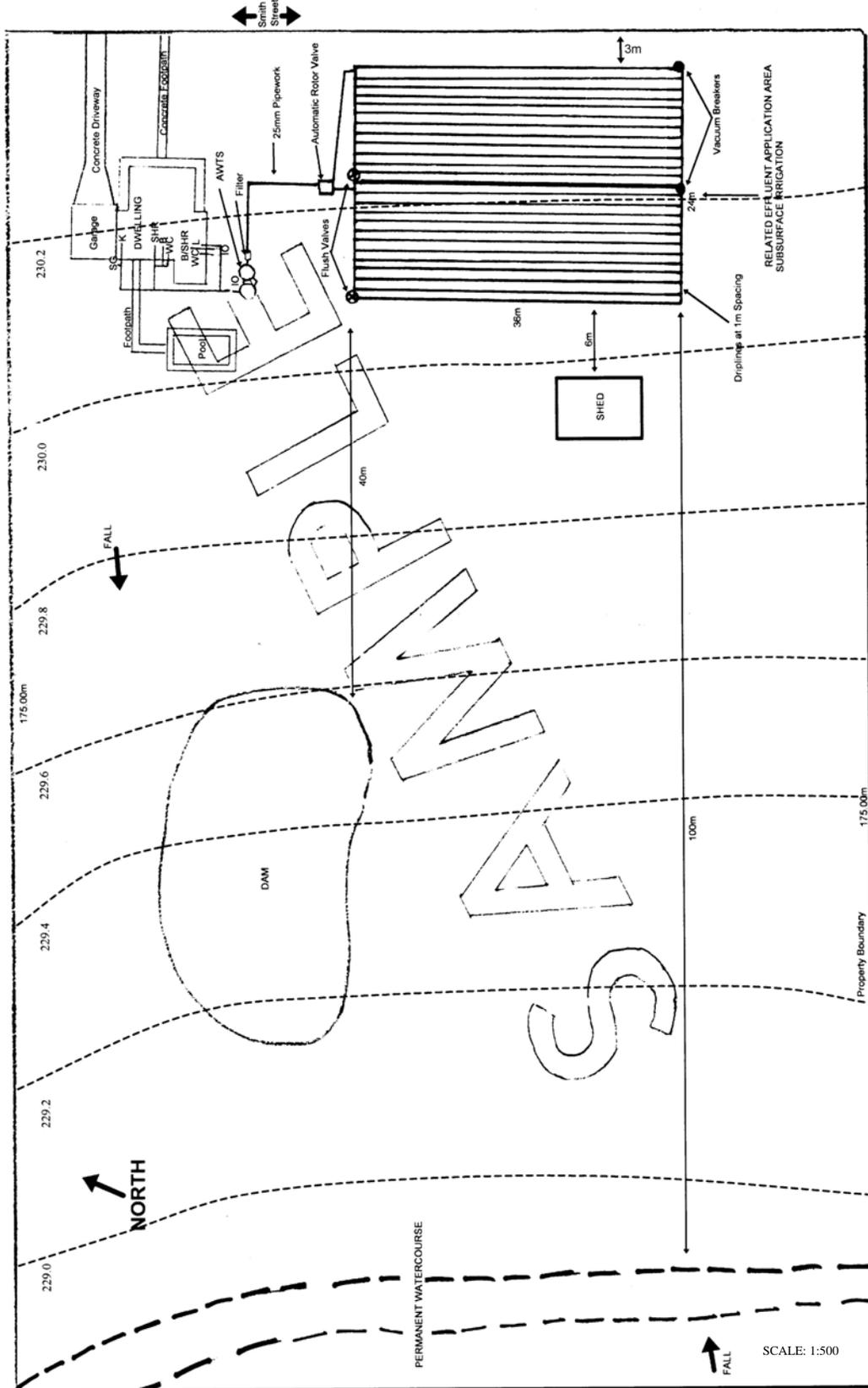
Site Plan 1: Fixed Surface Spray Irrigation



FOR: Mr & Mrs Roberts
AT: Lot 10, 99 Smith Street, CAMDEN

SCALE 1:500

Site Plan 2: Sub-Surface Drip Irrigation



Appendix 5. Sustainable Effluent Application Areas

Camden - Northern Climate

Secondary Treatment Irrigation / Disposal Systems - Requirements for Sustainable Irrigation (m²)

Soil Landscape	Soil Facet	1 Bedroom Dwelling	2 Bedroom Dwelling	3 Bedroom Dwelling	4 Bedroom Dwelling	5 Bedroom Dwelling	6 Bedroom Dwelling	7 Bedroom Dwelling
Blacktown	Crests	300	400	500	600	700	800	900
	Slopes	300	400	500	600	700	800	900
	Drainage Depressions	350	467	583	700	817	933	1050
Picton	Crests and Upper Slopes	300	400	500	600	700	800	900
	Colluvial Benches	300	400	500	600	700	800	900
	Footslopes and Drainage Lines	300	400	500	600	700	800	900
Luddenham	Crests	350	467	583	700	817	933	1050
	Upperslopes and Mid slopes	300	400	500	600	700	800	900
	Lower slopes and Drainage Lines	375	500	625	750	875	1000	1125
Monkey Creek	Downstream	NA						
Theresa Park	Floodplain and Near Terrace Edges	NA						
	Drainage Lines	NA						
South Creek	Near Channel	350	467	583	700	817	933	1050
	Lower Terrace	350	467	583	700	817	933	1050
Richmond	Near Terrace	375	500	625	750	875	1000	1125
	Back of Terrace	350	467	583	700	817	933	1050

Notes

1. For application of these areas, irrigation/disposal systems must be of a minimum secondary treatment standard.
2. NA - Not applicable in the Northern Camden area.
3. The Northern Camden Area has a Median Rainfall of 708 mm/year - Brownlow Hill Station (no. 68007)

Camden - Southern Climate

Secondary Treatment Irrigation / Disposal Systems - Requirements for Sustainable Irrigation (m²)

Soil Landscape	Soil Facet	1 Bedroom Dwelling	2 Bedroom Dwelling	3 Bedroom Dwelling	4 Bedroom Dwelling	5 Bedroom Dwelling	6 Bedroom Dwelling	7 Bedroom Dwelling
Blacktown	Crests	300	400	500	600	700	800	900
	Slopes	300	400	500	600	700	800	900
	Drainage Depressions	350	467	583	700	817	933	1050
Picton	Crests and Upper Slopes	NA						
	Colluvial Benches	NA						
	Footslopes and Drainage Lines	NA						
Luddenham	Crests	350	467	583	700	817	933	1050
	Upperslopes and Mid slopes	300	400	500	600	700	800	900
	Lower slopes and Drainage Lines	300	400	500	600	700	800	900
Monkey Creek	Downstream	300	400	500	600	700	800	900
Theresa Park	Floodplain and Near Terrace Edges	350	467	583	700	817	933	1050
	Drainage Lines	375	500	625	750	875	1000	1125
South Creek	Near Channel	400	533	667	800	933	1067	1200
	Lower Terrace	400	533	667	800	933	1067	1200
Richmond	Near Terrace	350	467	583	700	817	933	1050
	Back of Terrace	350	467	583	700	817	933	1050

Notes

1. For application of these areas, irrigation/disposal systems must be of a minimum secondary treatment standard.
2. NA - Not applicable in the Southern Camden area.
3. The Southern Camden Area has a Median Rainfall of 819 mm/year - Camden Airport Station (no. 68192)

TRANSPIRATION BEDS - PRIMARY TREATED EFFLUENT

Soil Landscape	Facet	Symbol	Classification	Requirements- Primary Effluent (m ²)						
				1 Bedroom Dwelling	2 Bedroom Dwelling	3 Bedroom Dwelling	4 Bedroom Dwelling	5 Bedroom Dwelling	6 Bedroom Dwelling	7 Bedroom Dwelling
Blacktown	Crests	bt2	Light Clay	108	144	180	216	252	288	324
	Slopes	bt2	Light Clay	108	144	180	216	252	288	324
	Drainage Depressions	bt1	Light Clay	108	144	180	216	252	288	324
Picton	Crests and Upper Slopes	pn1	Light Clay	108	144	180	216	252	288	324
	Colluvial Benches	pn1	Medium Clay	-	-	-	-	-	-	-
	Footslopes and Drainage Lines	pn1	Light Clay	108	144	180	216	252	288	324
Luddenham	Crests	lu5	Sandy Clay	108	144	180	216	252	288	324
	Upperslopes and Mid slopes	lu2	Medium-Heavy Clay	-	-	-	-	-	-	-
	Lower slopes and Drainage Lines	-	Sandy Clay	108	144	180	216	252	288	324
Monkey Creek	Downstream	mk1	Heavy Clay	-	-	-	-	-	-	-
Theresa Park	Floodplain and Near Terrace Edges	tp1	Sandy Clay Loam	54	72	90	108	126	144	162
	Drainage Lines	tp2	Light Clay	108	144	180	216	252	288	324
South Creek	Near Channel	sc1	Light-Medium Clay	-	-	-	-	-	-	-
	Lower Terrace	sc1	Medium-Heavy Clay	-	-	-	-	-	-	-
Richmond	Near Terrace	ri1	Sandy Clay Loam	54	72	90	108	126	144	162
	Back of Terrace	ri2	Light Clay	108	144	180	216	252	288	324

Notes

1. Trench systems are not recommended for medium to heavy clays.
2. 100% reserve area to be provided

Tables reproduced from: Martens & Associates 2004, Supply of Geotechnical and Hydrological Data – Suitability for On-site Wastewater Disposal / Reuse: Camden Local Government Area NSW.

Appendix 6. Application for Approval to Operate a Sewage Management System



CAMDEN COUNCIL
 37 John Street, Camden
 PO Box 183, Camden 2570
 Local Government Act, 1993

Date: _____
File No. _____
Registration No. _____

APPLICATION FOR APPROVAL TO OPERATE A SEWAGE MANAGEMENT SYSTEM
 Local Government (General) Regulation 2005

Property Details: Lot: _____ DP: _____ House No: _____ Street: _____ Suburb: _____

Name of Owner: _____ **Telephone:** _____

Postal Address: _____

Signature of Owner: _____

Name of Occupier (if rental property): _____ **Telephone:** _____

Name of Operator (if different to Owner): _____ **Telephone:** _____

Postal Address: _____

NOTE: THE OPERATOR OF A SEWAGE MANAGEMENT SYSTEM IS THE PERSON RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE SYSTEM INCLUDING ALL OTHER LEGAL RESPONSIBILITIES AND DUTIES.

Name of Maintenance

Contractor/Company: _____

Address: _____ **Contact telephone numbers:** _____

Indicate number of type of waste fittings to be connected to the tank:

Bath(s) Shower(s) Kitchen sink(s) Toilet(s) Basin(s) Laundry Other

Type of System (Please tick)	<u>Aerated wastewater treatment system (AWTS)</u> <input type="checkbox"/> Surface Irrigation <input type="checkbox"/> Subsurface Irrigation <input type="checkbox"/> Evapo-transpiration System	<u>Conventional</u> <input type="checkbox"/> Evapo-transpiration System <input type="checkbox"/> Pump Out
	<u>Other</u> <input type="checkbox"/> Brief Description	

If AWTS, supply the following details :

Number of sleeping rooms to be served: _____ bedrooms

Number of persons to be served: _____ people

Approximate age of sewage management facility: _____ Years

Location of alarm/warning system: _____

(Signed nominated Operator)

(Please print your full name here)

OFFICE USE ONLY:

Date Received: _____

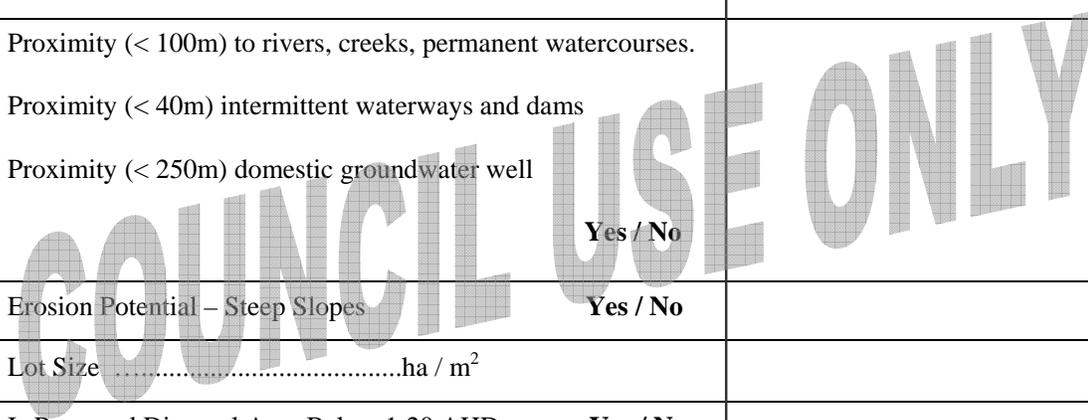
Staff member: _____

NOTE: No fee charged for submission of Application for Approval to Operate a Sewage Management System Form. Fee included within annual rates.

Please forward to Councils Environment & Health Branch.

Appendix 7: Risk Assessment Form – Approval to Install

RISK ASSESSMENT FOR NEW APPLICATIONS TO INSTALL.

1.0 PROPERTY INFORMATION	
Septic tank. Register No: Company: Owner: Phone: Address:	
2.0 RISK CLASSIFICATION	COMMENTS
Proximity (< 100m) to rivers, creeks, permanent watercourses.	
Proximity (< 40m) intermittent waterways and dams	
Proximity (< 250m) domestic groundwater well	
Yes / No	
Erosion Potential – Steep Slopes	Yes / No
Lot Sizeha / m ²	
Is Proposed Disposal Area Below 1:20 AHD	Yes / No
Is Proposed System installed below 1:100 AHD	Yes / No
Area Has Known Salinity Potential	Yes / No
Market Gardens Present or Down Gradient of the Disposal Area	Yes / No
Any Effects Native Vegetation	Yes / No
Heavy Clays Present	Yes / No
Potentially Shallow Watertable	Yes / No

3.0 GENERAL COMMENTS (Potential Environmental or Health Risks)

.....

.....

.....

.....

4.0 ASSESSING OFFICER

Name:

Signature:Date:

Appendix 8. Matters to Accompany Applications to Install, Construct or Alter Commercial Sewage Management Systems
(Reproduced with permission - Centre for Environmental Training 2003)

INFORMATION SOUGHT	SPECIFIC DETAILS	REASON
Project description		
A broad outline of the proposal.	Type and size of facility to be served. Proposed installation. Means of utilisation or disposal of the final effluent.	To facilitate a quick initial understanding of the proposal.
Site plans		
A locality plan.	Showing the site location in relation to public roads or places and any natural or artificial waters and proposed buffer zones.	To show the system in relation to adjoining properties and sensitive off-site receptors.
A contoured site plan.	Showing the location of the proposed plant and land application area or discharge point, if applicable, in relation to the principal buildings and the boundaries of the premises.	To facilitate site inspection. To show the system in relation to the on-site structures.
Drainage and stormwater management plans		
	Flood levels.	
	Proposed stormwater management measures, including any proposal to divert stormwater around the site.	To ensure stormwater is kept clear of the treatment system and land application area.
	In the case of industrial and commercial premises Drainage diagram and in the case of a residential development or municipal sewerage scheme a sewerage compilation plan.	To ensure wastewater systems and drainage systems are kept separate and are appropriately treated.
Flow and load assessment		
Details of processes generating load.	List each load generating process (eg, commercial kitchen, laundry etc).	To assess hydraulic, nutrient and organic load.
Size and type of facility to be served.	Types of facility served and per capita flow calculation (L/day) and BOD ₅ load (g/day). Calculation of peak flow and average flow.	To determine flow balancing requirement.

INFORMATION SOUGHT	SPECIFIC DETAILS	REASON
Expected wastewater quality		
Quantification of expected influent wastewater quality.	Analysis of or estimated quality of expected wastewater load in terms of: <ul style="list-style-type: none"> • Temperature • pH, • BOD₅ at 20⁰C, • Suspended solids (non-filtrable residue), • Faecal coliforms, • Radioactivity, • Oil, grease, floating solids • Infectious or contagious materials • Restricted substances • Nutrient content (N and P). 	To ascertain the composition of the wastewater and any special provision required of the treatment system.
System selection		
Rationale for and justification of type of system selected	Consider advantages and disadvantages of various system types and limitations of systems.	To ensure appropriate system selection and sizing.
Treatment process description		
Description of treatment process selected.	Schematic flow diagram to show stages in treatment process. Details of major components of treatment system equipment, such as aerators, sprays, pumps, etc and their operating efficiencies.	To ensure integrity and effectiveness of chosen design.
Staged development plan		
Description of staged development, if planned.	Indication of the size and timing of stages of the development served by the package treatment plant.	To ensure compatibility of the overall development with the planned growth of the package treatment plant.
Drawings		
Plan and section drawings of the proposed plant, ponds and baffles, land application area or discharge point.	Inlet and outlet arrangements. Major chambers and components.	To illustrate proposed system type and means of operation.

INFORMATION SOUGHT	SPECIFIC DETAILS	REASON
Estimated load for land application or discharge		
Qualification of expected load for land application or discharge.	Expected maximum volume of load to be land applied or discharged (L/day). Expected average volume of load to be land applied or discharged (L/day). Proposed method of measurement of load to be land applied or discharged. Description of sludge disposal method and estimated quantity of sludge to be generated.	To calculate the size of the required land application area. To calculate load based licence charge. To determine appropriate sludge disposal method.
Expected treated wastewater quality		
Quantification of expected treated wastewater quality.	Analysis of, or estimated quality of expected wastewater load in terms of: <ul style="list-style-type: none"> • Temperature • pH • BOD₅ at 20⁰C • Suspended solids (non-filtrable residue) • Faecal coliforms • Radioactivity • Oil, grease, floating solids • Infectious or contagious materials • Restricted substances • Nutrient content (N and P). 	To ascertain the composition of the treated wastewater prior to land application or discharge.
Disinfection		
Description of selected Disinfection system.	Necessity for Disinfection and, if required relative merits of disinfection options. Description of the chosen method of disinfection appropriate for selected land application or discharge.	To provide appropriate disinfection in the light of the final land application or disposal option selected.
Land application or disposal system selection		
Rationale for and justification of type of land application or disposal system selected.	Consider advantages, disadvantages and suitability of various land application and disposal systems. A schematic flow sheet of the land application or discharge method proposed.	To ensure suitable land application or disposal system is chosen to provide the necessary public health and Environmental protection.

INFORMATION SOUGHT	SPECIFIC DETAILS	REASON
<p>Land application system sizing</p> <p>Site and soil assessment for land application area sizing.</p>	<p>Soil characteristics:</p> <ul style="list-style-type: none"> • Soil profile - horizons • Soil textural analysis • Soil hydraulic conductivity • Appropriate loading rate • Erosion potential • Emersion test <p>Topography:</p> <ul style="list-style-type: none"> • Gradient & Slope form • Flood potential • Aspect <p>Description of climate:</p> <ul style="list-style-type: none"> • Rainfall • Evaporation • Storm intensities • Prevailing wind <p>Vegetation:</p> <ul style="list-style-type: none"> • Cover/proposed cover • Crop factor <p>Water balance calculations</p> <p>Nutrient balance (N and P)</p> <p>Groundwater:</p> <ul style="list-style-type: none"> • Depth to groundwater • Location of existing wells • On-site / Adjacent to site • Current use of groundwater • Groundwater recharge area? • Groundwater chemistry <p>Surface waters:</p> <ul style="list-style-type: none"> • Proximity • Current use • Flow characteristics <p>Pre-treatment:</p> <ul style="list-style-type: none"> • Design of pre-treatment • Effect on constituents loads • Disinfection method • Implications for soil <p>Type of irrigation system:</p> <ul style="list-style-type: none"> • spray, trickle or drip, • surface or sub-surface. <p>Site Plan:</p> <ul style="list-style-type: none"> • Proximity to dwellings, etc. • Proximity to sensitive receptors, eg, play areas etc. • Applicable buffer zones. <p>A schematic diagram of the system controls including pipes, pumps valves, timers and alarms.</p>	<p>To ensure suitable land application location and sizing.</p>

Appendix 9. Approval to Operate a Sewage Management System – Site Inspection form



**CAMDEN COUNCIL
ON-SITE SEWAGE MANAGEMENT FOR SINGLE HOUSEHOLDS
SITE ASSESSMENT REPORT FOR AN
APPROVAL TO OPERATE**

Property No: _____ Date: _____

Assessment Officer (EHO): _____

Site Address: Lot - _____ DP - _____ H/No. - _____

_____ SUBURB: _____ Postcode: _____

(1) PROPERTY DETAILS

OWNERS DETAILS

Name: _____

Address: _____

SUBURB: _____ Postcode: _____

Phone: _____

OCCUPIERS DETAILS

Name: _____

Address: _____

SUBURB: _____ Postcode: _____

Phone: _____

Slope (%)	
Water Source	Reticulated / Tank
Exposure (Good/ Average/ Poor)	
Wastewater Quantity (L/d) *	

No. of Bedrooms	
No. of Occupants	
Nearest House (m)	
Rental Property	Yes / No

* Water Supply – reticulated = 180 L/p/d, Tank/Rainwater = 140 L/p/d

Allotment Size (m²/ha): _____

Are water conservation devices installed? YES / NO

If YES, give detail: _____

(2) SYSTEM DETAILS

TYPE OF SYSTEM			
Septic tank / Pumpout	<input type="checkbox"/>	AWTS / Surface Irrigation	<input type="checkbox"/>
Septic tank / Transpiration Bed	<input type="checkbox"/>	AWTS / Sub-surface Irrigation	<input type="checkbox"/>
Septic tank / Absorption Area	<input type="checkbox"/>	Greywater System	<input type="checkbox"/>
Waterless Composting Toilet	<input type="checkbox"/>	Wet Composting Toilet	<input type="checkbox"/>
Other (ie Aerobic sand filter device): _____			
Last Service/Desludging			
AWTS Service Agent			
Number of Tanks			
Age of System (yrs)			
Are Tanks above ground >100mm?		YES / NO	
Comments: _____			
Condition of Tank: Excellent Good Fair Poor			
Manufacturer: _____			
Grease Trap?		YES / NO	
Does Trap require cleaning?		YES / NO	
Grease Trap Condition: Excellent Good Fair Poor			
Comments: _____			
Greywater System Present?		YES / NO	
Is Greywater System Council approved?		YES / NO	
Comments: _____			
If the system is pumpout, who collects the effluent? _____			
Contractors name and Licence No.: _____			
Comments: _____			

(3) LAND APPLICATION DETAILS

Type of Application Area		Flood Potential	YES / NO
Size of Primary Application Area (m ²)		Erosion Potential	YES / NO
Size of Secondary Application Area (m ²)		Any run-on or seepage	YES / NO
Comments: _____			
Condition of Disposal Field: _____			
Vegetation Present: _____ Topography: _____			
Site Drainage:	Excellent	Good	Fair
Comments: _____			Poor
Surface Rocks?			YES / NO
Describe: _____			
Distance of Land Application Area to (m):			
Watercourse/Dam		Swimming Pool	
Bushland		Paths/ Driveways	
Property Boundary		Buildings	
Easements		Other	
Do Buffer Distances satisfy Environment & Health Guidelines? YES / NO			
Comment: _____			
Distribution line buried 100mm: YES / NO			
Condition of Line: Satisfactory Unsatisfactory			
Odour Present (eg Chlorine, effluent etc) YES / NO			

(4) AERATED WASTEWATER TREATMENT SYSTEMS (AWTS)

AWTS operating at time of assessment?	YES / NO				
Is effluent distributed only within the property?	YES / NO				
Are any unapproved fittings used on the irrigation system? Comment:	YES / NO				
Is Service history up to date for pervious 12 months	YES / NO				
Is the AWTS fitted with a malfunction warning system?	YES / NO				
Is there an operator's manual on-site?	YES / NO				
What activities is the land application area used for? _____					
Is there any run-off from the land application area? Comments: _____	YES / NO				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 2px;">No. of sprinklers</td> <td style="width: 10%;"></td> <td style="width: 30%; padding: 2px;">Coverage of sprinklers (m²)</td> <td style="width: 10%;"></td> </tr> </table>	No. of sprinklers		Coverage of sprinklers (m ²)		
No. of sprinklers		Coverage of sprinklers (m ²)			
General Comments: _____ _____					

(5) ABSORPTION TRENCHES / TRANSPIRATION BED

Is the Absorption trench parallel with the contours of the land?	YES / NO
Is the Absorption trench / transpiration bed protected from damage?	YES / NO
Is the Absorption trench / transpiration area fenced off?	YES / NO
Dimensions of trench or bed (area m ²): _____	
Are the visible signs of effluent resurfacing / pooling?	YES / NO
Comments: _____ _____	

(6)COMPOSTING TOILET

Is there an external door or extraction chute to collect humus?	YES / NO
Does the fan operate continuously?	YES / NO
How is the compost humus used?_____	
How is the greywater managed?_____	
Is there an instruction notice in a fixed position?	YES / NO
Comments:_____	

(7) GENERAL COMMENTS

Are there any specific environmental constraints? _____
Is there any specific health constraints? _____
Are there any impacts to adjoining properties? _____

COUNCIL USE ONLY

(10) ON-SITE SEWAGE MANAGEMENT SYSTEM ASSESSMENT

SUMMARY REPORT

CRITERIA	RATING	JUSTIFICATION
Impact on Public Health	
Impact on Water Quality (Ground & Surface)	
Impact on Native Flora	
Impact on Community Amenity	
Impact on Soils	

COUNCIL USE ONLY

- RATING CODE:**
- 1.** Unlikely Impact
 - 2.** Potential Impact
 - 3.** Existing Impact

(11) OVERALL SENSITIVITY ASSESSMENT

Reaudit/Operating Approval Due: **HIGH** **2yrs** **(Circle)**
 MODERATE **4yrs**
 LOW **6yrs**

Reinspection Due:

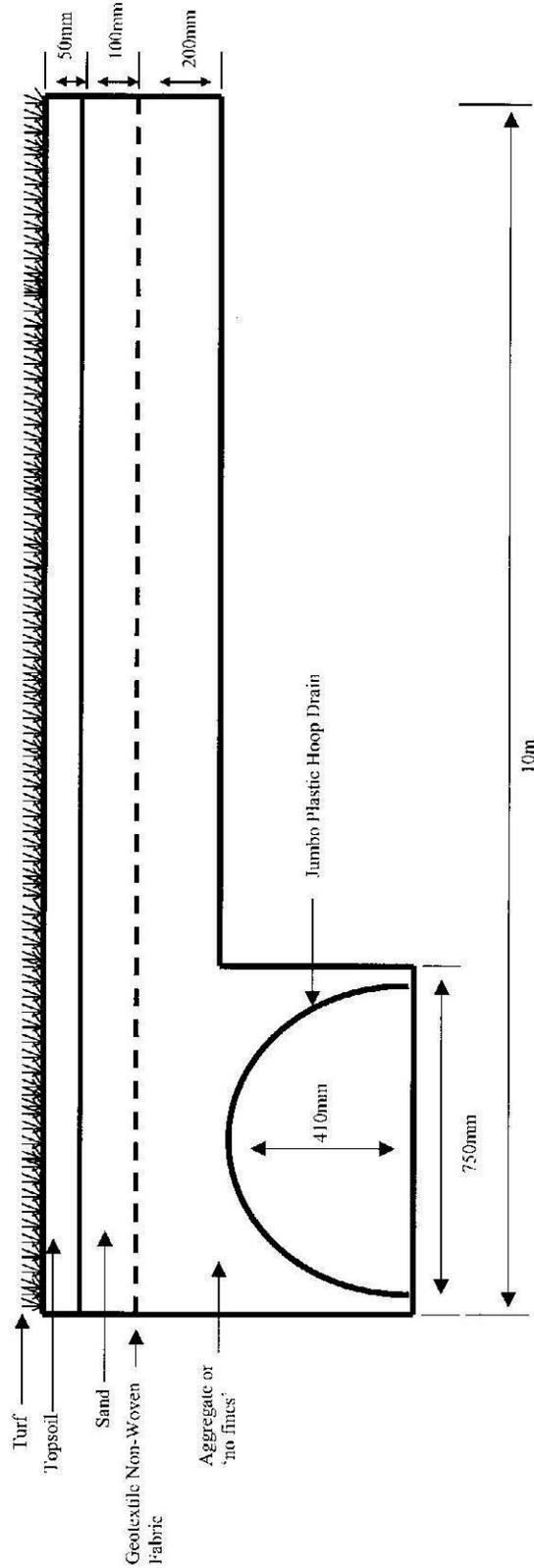
Signed Assessment Officer:

Appendix 10. Vegetation Suitable for land Application Areas

BOTANICAL NAME	COMMON NAME	APPROXIMATE HEIGHT(m)
TREES		
<i>Agonis flexuosa</i>	'Willow Myrtle'	5-6
<i>Allocasuarina verticillata</i>	'Drooping She-oak'	4-10
<i>Acacia baileyana</i>	'Cootamundra Wattle'	3-5
<i>Banksia spp</i>		
<i>Callistemon spp.</i>	'Taree Pink'	
<i>Casuarina glauca</i>	'Swamp She-oak'	20
<i>Casuarina cunninghamiana</i>	'River She-oak'	20-35
<i>Eucalyptus baueriana</i>	'Blue Box'	20-30
<i>Eucalyptus elata</i>	'River Peppermint'	20-45
<i>Eucalyptus maculata</i>	'Spotted Gum'	25-40
<i>Eucalyptus moluccana</i>	'Grey Box'	25-40
<i>Eucalyptus tereticornis</i>	'Forest Red Gum'	30-40
<i>Eucalyptus viminalis</i>	'Ribbon or Manna Gum'	20-40
<i>Ficus spp.</i>		
<i>Hakea spp.</i>		
<i>Melaleuca armillaris</i>	'Bracelet Honey Myrtle'	3-4
<i>Melaleuca decora</i>	'White Feather Honey Myrtle'	6-20
<i>Melaleuca decussata</i>		
<i>Melaleuca lineariifolia</i>	'Snow in Summer'	8
<i>Melaleuca styphelioides</i>	'Prickly-leaved Paperbark'	6-15
<i>Melaleuca violacea</i>		
<i>Melaleuca thymifolia</i>		8-10
<i>Syzygium paniculatum</i>	'Bush Cherry'	8-10
<i>Tristiaopsis laurina</i>	'Water Gum'	3-5
SHRUBS		
<i>Acacia floribunda</i>	'Gossamer Wattle'	2-4
<i>Acacia decurrens</i>	'Sydney Green Wattle'	10-16
<i>Acacia parramattensis</i>	'Parramatta Green Wattle'	8
<i>Acacia ulicifolia</i>		
<i>Baeckea linifolia</i>	'Prickly Moses'	1.5
<i>Eremophila spp.</i>		
<i>Grevillea spp.</i>		
<i>Callistemon spp.</i>		
GROUND COVER/CLIMBERS		
<i>Hardenbergia violacea</i>	'Purple Coral Tree'	
<i>Hibbertia spp.</i>		
<i>Kennedia rubicunda</i>	'Dusky coral Pea'	
<i>Passiflora spp.</i>		
<i>Patersoonia occidentalis</i>	'Native Iris'	
<i>Gahnia spp.</i>		
<i>Juncus spp.</i>		
<i>Viola spp.</i>		
GRASSES		
<i>Pennisetum clandestinum</i>	'Kikuyu grass'	
<i>Stenotaphrum secundatum</i>	'Buffalo grass'	
<i>Lomandra longifolia</i>	'Mat Rush'	
<i>Poa lab</i>		
<i>Carex spp.</i>		

Appendix 11. Transpiration Bed – Cross Section & Plan View (*not to scale*)

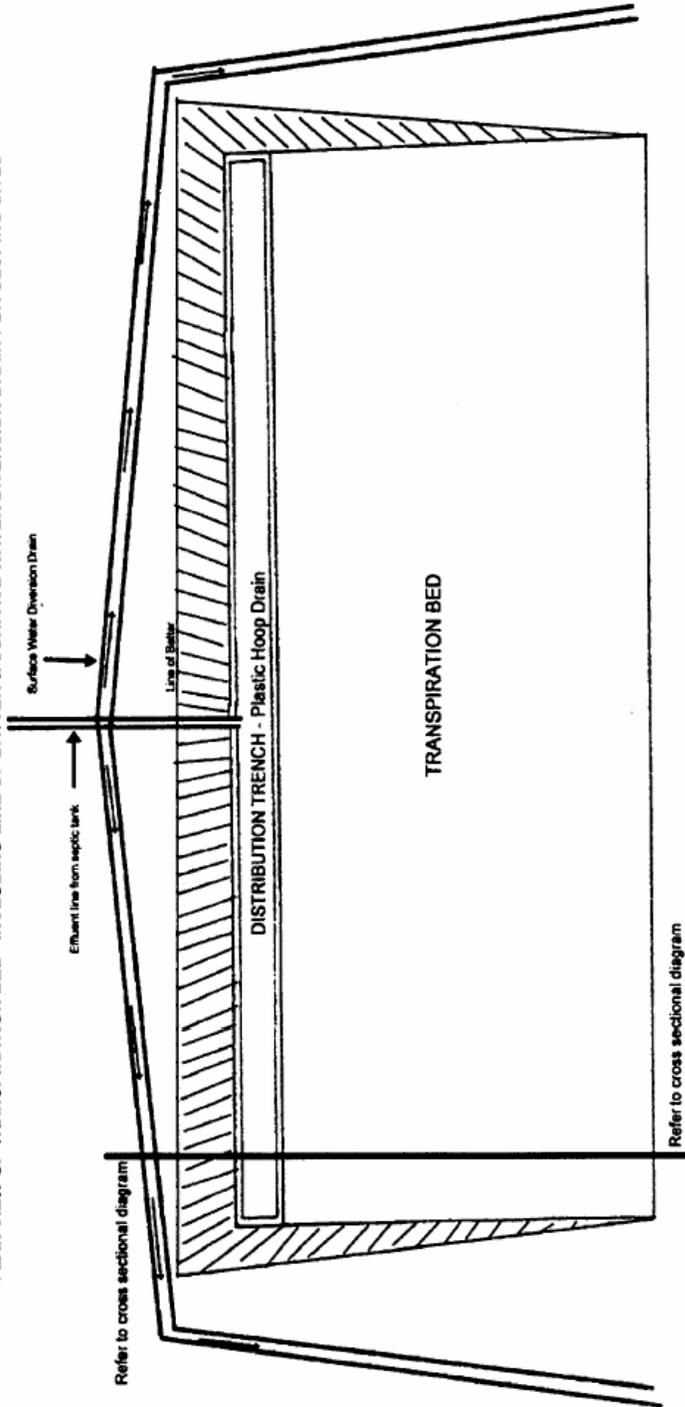
Cross-sectional Diagram of an Evapo-transpiration Bed



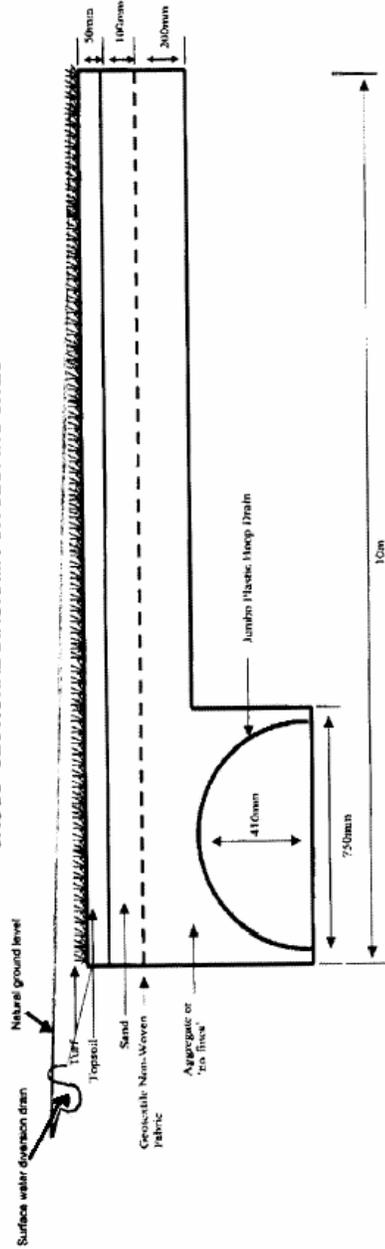
NOTE:

1. Length of Transpiration Bed to comply with Councils site specific effluent application areas
2. T-Bed not suitable on sites with a slope greater than 25 Degrees

PLAN VIEW OF TRANSPIRATION BED - INCLUDING LINE OF BATTER & SURFACE WATER DIVERSION DRAIN FOR SLOPING SITES



CROSS-SECTIONAL DIAGRAM FOR SLOPING SITES



NOTE:
 1. Length of Transpiration Bed to comply with Councils site specific effluent application areas
 2. T Bed not suitable on sites with a slope greater than 25 Degree