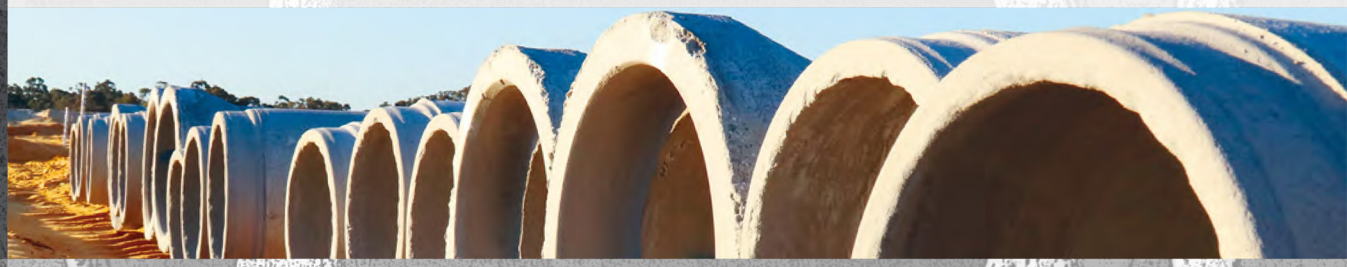
GOVERNMENT OF
WESTERN AUSTRALIA

DRAFT FOR CONSULTATION

Government Sewerage Policy

November 2016



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HOW TO MAKE A SUBMISSION

The Western Australian government has released the attached revised draft *Government Sewerage Policy* for public comment. The policy has been updated and amended by the Perth Metropolitan Region and Country Sewerage Policy Review Committee and supersedes the public consultation draft released in 2011 by the Department of Health.

Once finalised, the policy will provide direction on the provision of sewage disposal for future strategic planning, subdivision and development in Western Australia.

The amended draft policy requires consideration of sewage disposal at the earliest stage of planning, which will ensure that future development does not create new sewage-related health or environmental problems, or result in costly remediation measures.

An evidence-based approach has been adopted in the revised policy. Accompanying Explanatory Notes provide the technical justifications for the policy provisions. Mapping of areas that are classed as 'sewage sensitive' is also available through the Department of Planning's PLANWA Map viewer at www.planning.wa.gov.au/planwa

You are invited to review the draft policy and make a submission during the consultation period, which closes at **5pm 10 February 2017**.

Submission forms may be downloaded from – www.planning.wa.gov.au/gsp

Submissions on the policy can be:

- emailed to – sewerage@planning.wa.gov.au
- posted to – Government Sewerage Policy Project Manager

  Department of Planning
  Locked Bag 2506
  Perth, WA 6001

As submissions may be made public, please indicate whether you wish for your submission to remain anonymous.

For more information, please contact the Project Manager on (08) 6551 9000.

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1. INTRODUCTION

This policy establishes the Western Australian Government's position on the provision of reticulated sewerage in the State for the rezoning, structure planning, subdivision and development of land.

Whilst there have been improvements in technology associated with on-site sewage treatment systems, reticulated sewerage remains the most reliable, efficient and environmentally acceptable means of sewage disposal. In recognition of the risks associated with their installation, operation and maintenance, on-site sewage disposal systems servicing individual lots are not considered as an appropriate alternative to reticulated sewerage for most subdivision and development.

The widespread historical use of on-site sewage systems in Western Australia has resulted in health, environment and amenity issues. These are still being addressed through the Infill Sewerage Program, at significant cost to the State.

Sewage discharge contains nutrients, metals, salts, endocrine (or hormone) disrupting chemicals, bacteria, viruses and other pathogens. Discharges from sewage treatment plants are regulated to ensure that the quality of treated sewage is satisfactory for release into the environment or for its beneficial re-use, without an unacceptable impact on the environment and with the greatest regard for public health.

Reticulated sewerage provides flexibility to support the widest variety and changes of land use. Innovation in reticulated sewerage provision has also increased the opportunities for alternative approaches, many of which provide cost-efficient options which also result in better environmental outcomes. The provision of reticulated sewerage as part of greenfield subdivision has a lower cost than retrofitting services in established urban areas. This 'user pays' approach also avoids the imposition of future costs upon the community to mitigate the environmental, health and amenity impacts associated with on-site sewage disposal and the provision of infill reticulated sewerage.

The preparation of this policy has involved the review of the previous Government sewerage policies, (Government Sewerage Policy – Perth Metropolitan Region, released in 1982 and amended 1990 and 1996) and the draft Country Sewerage Policy, released in 2002 and amended 2003) and considered changes in wastewater technologies and the provision of sewerage services.

This policy adopts a risk management approach to sewage management that is consistent with *Australian/New Zealand Standard 1547 On-site domestic wastewater management.* This approach has been used to determine instances where reticulated sewerage will be required and provide guidance for the assessment of planning proposals where on-site sewage disposal is proposed.

2. POLICY PURPOSE

This policy has been prepared to:

- Require the provision of reticulated sewerage to all new subdivision and development in Western Australia unless the exemptions of this policy apply;
- Provide guidance for the consideration of subdivision and development proposals where the provision of reticulated sewerage cannot be achieved;
- Adopt a best practice approach to the provision of unsewered development in accordance with *Australian/ New Zealand Standard 1547 On-site domestic wastewater management*; and
- Provide guidance on how sewerage servicing is to be addressed in planning and development decisions.

3. POLICY OBJECTIVES

The objectives of this policy are:

- To protect public health and amenity;
- To protect the environment and the State's water and land resources;
- To promote the efficient use of infrastructure and urban land; and
- To minimise costs to the broader community by ensuring an appropriate level and form of sewerage servicing is provided.

4. DEFINITIONS

Annual Exceedance Probability (AEP)	The probability that a given rainfall total accumulated over a given duration will be exceeded in any one year. Also known as Average recurrence interval (ARI).
Aerobic treatment unit	*Refer to secondary treatment system.*
Built Strata	A built strata contains buildings which make up the boundaries of the land parcel within the Strata Plan. It shows buildings and agreed part lot boundaries that are defined by fences, driveways and other structures on the property. Built stratas are generally used for multiple dwellings.
Decision-maker	The person or body responsible for the determination of a planning application under the *Planning and Development Act 2005*.
Development	Development as defined under the *Planning and Development Act 2005,* as amended, that results in the production of sewage.
Ecological Community	A naturally occurring biological assemblage that occurs in a particular type of habitat.
Environmentally hazardous material	Material identified in *Environmental Protection (Unauthorised Discharges) Regulations 2004* that must not be discharged into the environment. There may be other materials but these should be considered on a case-by-case basis.
Green title lot	A lot owned in fee simple issued with a certificate of title under the *Transfer of Land Act 1893,* as amended, other than a strata lot or survey strata lot.
Heavy soils	Clay loams, light clays and medium to heavy clays as per *AS/NZS 1547 On-site domestic wastewater management*.
Incremental subdivision	The use of vacant or underutilised land within predominantly built-out areas for further development. Previously referred to as small infill subdivision.
Land application area	The unencumbered horizontal plan area to which treated sewage from an on-site sewage disposal system is distributed. This area is restricted to the distribution of treated sewage.
Lot	For single houses, as defined under the *Planning and Development Act 2005*, as amended. For multiple or grouped dwellings, the parent lot. For lots in relation to a strata scheme, a survey-strata scheme, or a lot shown as common property on a survey-strata plan, as defined in the *Strata Titles Act 1985*. Includes freehold, survey strata or vacant strata lots.

Marine Reserve	A marine nature reserve, a marine park or a marine management area as defined under section 6(6) of the *CALM Act, 1984*.
Nutrient	In the context of this policy, a nutrient is Nitrogen or phosphorus that is contained in sewage. These nutrients affect water quality and can result in water contamination, adverse impacts to public health and to wildlife which use the water for drinking or as habitat.
Non-Residential Development	Any development that does not include places for living. Non-residential development includes, but is not limited to retail services, offices, entertainment venues, leisure centres, community centres, medical facilities and industrial land uses.
Primary treatment	The separation of suspended material from sewage in septic tanks, primary settling chambers, or other structures (including those which may be used to treat trade waste), before discharge to a leach drain or secondary treatment system.
Priority areas	Priority 1 (P1) Priority 2 (P2) and Priority 3 (P3) areas that are assigned to land within Public drinking water source areas under the *Metropolitan Water Supply, Sewerage, and Drainage By-laws 1981* in the Metropolitan area and the Department of Water's policy and drinking water source protection reports throughout the rest of the State.
Priority Ecological Community	Possible threatened ecological communities that do not meet survey criteria and that are listed in the Department of Parks and Wildlife's Priority Ecological Community Lists. These communities are ranked Priority 1-5 based on urgency of assessment of status.
Public drinking water source area	The area from which water is captured to supply drinking water. It includes all underground water pollution control areas, catchment areas and water reserves constituted under the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909* or the *Country Areas Water Supply Act 1947.*
Reservoir protection zone	The area measured two kilometres from the high water mark of a drinking water reservoir, and inclusive of the reservoir. This is referred to as a prohibited zone under the *Metropolitan Water Supply, Sewerage, and Drainage Act By-laws 1981* in the Metropolitan area and the Department of Water's policy and drinking water source protection reports throughout the rest of the state. The zones do not extend beyond the boundary of the Public drinking water source area.
Residential subdivision	The subdivision of land for the creation of lots less than four hectares where residential land uses are proposed. Includes, though is not restricted to, land that is zoned residential, rural residential, rural living or special rural.
Reticulated sewerage	A network of sewers managed by a water service provider that conveys sewage from any development or subdivision for treatment and disposal off-site (for example large scale centralised schemes or smaller scale decentralised schemes that use innovative technology to service two or more lots).
Reticulated sewerage scheme	A network of sewers and associated wastewater treatment plant managed by a water service provider.
Rural land	Land identified in an endorsed strategy or zoned for rural or agricultural land use under a local planning scheme or strategy, excluding rural residential/ rural living areas.

Rural land use	Land uses that are rural in nature and that support and are associated with primary production, basic raw material extraction, biodiversity conservation, natural resource management, public purposes and protection of landscapes and views. Does not include rural residential/rural living, which is not considered a rural land use.
Secondary treatment	Microbial digestion and physical settling and filtering processes and decomposition of sewage received from a primary treatment unit (for example Aerobic Treatment Unit). The quality of effluent after secondary treatment is higher than after primary treatment.
Secondary treatment system	A sewage treatment system which produces treated effluent of secondary standard, i.e. 20 mg/L of Biochemical Oxygen Demand $(BOD)_5$, 30 mg/L of Total suspended solids (TSS) and 10 cfu/100 mL of Escherichia (E) *coli.*
Secondary treatment system with nutrient removal	Microbial digestion and physical settling and filtering process and decomposition of sewage received from a primary treatment unit that discharges treated sewage with phosphorus and nitrogen concentrations of less than 1mg/L and 10mg/L respectively. These targets only apply to on-site treatment systems in Sewage sensitive areas and public drinking water source areas.
Septic tank	*Refer to primary treatment.*
Sewage sensitive area	Defined as: a) estuary catchments on the Swan and Scott Coastal Plains; b) within 10 kilometres of Wilson Inlet, Torbay Inlet, Manarup Lagoon, Lake Powell, Princess Royal Harbour and Oyster Harbour c) land that drains to and is within two kilometres of the estuarine areas of the following: • Dampier Creek (Broome) • Fitzroy River • Ord River • Harding River • Port Hedland Harbour • Chapman River • Gascoyne River • Greenough River • Hill River • Irwin River • Margaret River • Murchison River • Hardy Inlet • Walpole-Nornalup Inlet • Wellstead Estuary c) Within two kilometres of the following coastal embayments: Cockburn Sound, Coral Bay, Cowaramup Bay, Flinders Bay, Geographe Bay, Jurien Bay, Koombana Bay, Mangles Bay, Roebuck Bay, Shark Bay and Warnbro Sound; d) The area within a boundary, which is one kilometre up-groundwater-gradient and 250 metres down-groundwater-gradient of a significant wetland; or where the groundwater gradient is unknown within one kilometre of the significant wetland; e) Habitats of threatened ecological communities and priority ecological communities, specially protected water-dependent fauna; and f) Wild rivers catchments.

	Note: site specific assessments undertaken during the land planning process may identify additional sewage sensitive areas to those listed above, for example where limited mapping has been undertaken. Any potential impacts should be considered and managed on a case-by-case basis. *Refer to sewage sensitive area mapping prepared to accompany this policy.*
Sewage	Includes nightsoil, faecal matter or urine, and any waste composed wholly or in part of liquid. This includes wastewater and may include trade waste as defined under the *Water Services Act 2012*.
Sewerage Service Provider	A person or entity that provides a wastewater service in accordance with the *Water Services Act, 2012.*
Single house	A dwelling standing wholly on its own green title or survey strata lot.
Significant wetland	Includes Ramsar Wetlands; those listed in the Australian Government's Directory of Important Wetlands; wetlands categorised as Conservation Category in the Department of Parks and Wildlife's Swan Coastal Plain geomorphic wetlands database, wetlands listed in the *South Coast Significant Wetlands* database and other wetlands that may be identified for protection during the land planning process.
Survey strata	A lot and any associated common property as shown on a registered survey strata plan prepared in accordance with section 4(1b) of the *Strata Titles Act 1985,* as amended.
Trade waste	Any wastewater, discharged from a business or industry, aside from that which comes from staff amenities or office facilities. Some trade waste may contain environmentally hazardous materials which must not be discharged into the environment (refer to the *Environmental Protection (Unauthorised Discharges) Regulations 2004*). Discharge of trade waste into a reticulated sewerage system is subject to approval from the sewerage service provider.
Threatened Ecological community	An ecological community that has been endorsed by Western Australia's Environment Minister as being subject to processes that threaten to destroy or significantly modify it across much of its range and fits into one of the categories 'presumed totally destroyed',' critically endangered', 'endangered' or 'vulnerable'.
Wastewater	Means sewage, and does not include stormwater, surface water or groundwater of a type that is ordinarily drained from land as part of the provision of a drainage service.
Water dependent fauna	Fauna which live predominantly or entirely in the water or which rely on aquatic habitats and their associated ecosystems for all or part of their life cycle.
Waterway	Any river, creek, stream or brook, including its estuary. This includes systems that flow permanently, or seasonally; and parts of the waterway that has been artificially modified. A waterway usually includes the floodplain; however, for the purpose of this policy, the floodplain is excluded.
Wellhead protection zone	The area within a public drinking water source area that surrounds a bore, as declared under *Metropolitan Water Supply, Sewerage, and Drainage By-laws 1981* and defined via the Department of Water's policy and drinking water source protection reports throughout the rest of the state. These zones are generally circular, with a 500 metre radius around each production bore in a Priority 1 area and a 300 metre radius around each production bore in Priority 2 and Priority 3 areas. The zones do not extend outside the boundary of the public drinking water source area.

5. POLICY APPLICATION

This policy applies to the preparation, provision of advice and determination of planning proposals relating to:

- strategic plans including sub-regional plans, regional planning frameworks, and local planning strategies;
- the preparation and amendment of region and local planning schemes, except for the purpose of rural land use;
- structure plans;
- subdivision for the creation of lots less than four hectares; and
- development other than rural land use on land that is zoned rural in a local planning scheme or development of a single house on a single lot.

Schedules 1 and 2 provide guidance on how this policy is to be applied at different stages of the planning process. Schedule 3 provides guidance on technical components to the provision of on-site sewage disposal.

This policy does not override the provisions of any relevant legislation including any relevant approval requirements.

6. POLICY MEASURES

6.1 REQUIREMENT TO CONNECT TO RETICULATED SEWERAGE

All subdivision and development should be connected to reticulated sewerage. Possible exceptions are outlined in section 6.2, but do not include the following instances:

(1) where the provision of reticulated sewerage is required by a local planning scheme or a policy, strategy or plan endorsed by the Western Australian Planning Commission;

(2) when any stage or part of the subdivision or development is already connected to reticulated sewerage;

(3) where the decision-maker determines the subdivision or development can be reasonably connected to reticulated sewerage, having consideration of the best practicable servicing option;

(4) where the responsible authority determines connection to reticulated sewerage is required on planning grounds. This includes instances where the absence of reticulated sewerage will jeopardise future land uses proposed through a strategic planning document such as a sub-regional structure plan or local planning strategy;

(5) where the absence of reticulated sewerage is determined by the responsible authority to prejudice the ability to provide sewerage to the local area; or

(6) when the absence of reticulated sewerage is determined by the responsible authority to pose an unacceptable risk to public health, the environment or water resources. This includes, though is not restricted to, instances where:

   a) the minimum site requirements for on-site sewage disposal systems (as defined in provision 6.4) cannot be reasonably met;

   b) the cumulative impact of on-site sewage disposal are deemed likely to have a detrimental impact on the water quality of a public drinking water source area, sewage sensitive area or other waterway or wetland; and

   c) urban, industrial or commercial subdivision is proposed in public drinking water source areas.

6.2 EXEMPTIONS TO REQUIREMENT TO CONNECT TO RETICULATED SEWERAGE

Exemptions to the mandatory requirement for connection to reticulated sewerage will only be considered where provisions 6.1 (1) to (6) do not apply.

Consideration may be given to an exemption from the provision of reticulated sewerage in the following circumstances, provided that the statutory authority is satisfied that the proposal is capable of accommodating on-site sewage disposal without endangering public health or the environment and the minimum site requirements for on-site sewage disposal systems outlined in section 6.4 and Schedule 3 of this policy can be met.

(1) Residential subdivision proposals for the creation of lots greater than:

   a) two hectares in Priority 2 public drinking water source areas;

   b) one hectare in Priority 3 public drinking water source areas in rural residential/rural living zones;

   c) one hectare in sewage sensitive areas;

   d) 2,000m^2 where the proposed lot is not in a public drinking water source area or a sewage sensitive area. For heavy soils, secondary treatment systems will be required to achieve this lot size (refer to Table 1 in Schedule 3).

(2) Incremental residential subdivision in urban areas that are already developed in accordance with an urban zoning subject to:

   a) the proposed lots are not in a public drinking water source area or a sewage sensitive area; and

   b) the average lot size is not less than 1,000m^2, with a minimum individual lot size of 950m^2. In heavy soils, larger lot sizes and/or secondary treatment systems will be required (refer to Table 1 in Schedule 3).

(3) Residential subdivision in towns outside the Perth Metropolitan and Peel regions without an established sewerage scheme where proposed lots are:

   a) not in a public drinking water source area or sewage sensitive area; and

   b) the average lot size is not less than 1,000m^2, with a minimum of 950m^2. In heavy soils, larger lot sizes and/or secondary treatment systems will be required (refer to Table 1 in Schedule 3). Smaller lots may be considered on a case-by-case basis, provided that an independent soil and site assessment is undertaken in accordance with *Australian/New Zealand Standard 1547 On-site domestic wastewater management* to demonstrate that the proposed lots are capable of accommodating on-site sewage disposal and to identify the most appropriate type of on-site disposal system to be used. Where a secondary treatment system is required to manage public health or environmental impacts, notifications on title may be required in accordance with 6.4 (8) and 6.4 (9) of this policy.

(4) Residential subdivision in towns outside the Perth Metropolitan and Peel regions with existing sewerage schemes (as listed in Schedule 4) where:

   a) on-site sewage disposal is determined to be the best practicable option for servicing, and unsewered subdivision at the density proposed is specifically provided for through the provisions of the local planning scheme or a local structure plan endorsed by the Western Australian Planning Commission;

   b) proposed lots are not in a public drinking water source area or sewage sensitive area; and

   c) the average lot size is not less than 1,000m^2, with a minimum of 950m^2. In heavy soils, larger lot sizes and/or secondary treatment systems will be required (refer to Table 1 in Schedule 3).

(5) Development applications and non-residential subdivision that:

a) are remote from existing or proposed sewerage schemes and the proposed development cannot be connected to reticulated sewerage (Technical advice should be sought from the sewerage service provider); and

b) utilise secondary treatment systems with nutrient removal if in a sewage sensitive area or a public drinking water source area; and

c) where the proponent has demonstrated, to the satisfaction of the Western Australian Planning Commission on the advice of the Department of Health and the Department of Water that there is sufficient capacity to treat and dispose of sewage and contain associated buffers on-site. Consideration will be given to the maximum hydraulic load that can be contained within the lot and the potential impacts on waterways and wetlands.

The minimum lot size for non-residential lots will be determined on a case-by-case basis.

(6) Land in a sewage sensitive area that is already zoned for urban use with a Residential (R) 5 or R10 density coding based primarily on the provisions of the Government Sewerage Policy (Perth Metropolitan Area)(1996) or the draft Country Sewerage policy may be subdivided in accordance with the existing density coding provided that the minimum site requirements as outlined in provision 6.4 are met. A secondary treatment system with nutrient removal may be required.

6.3 MINIMUM REQUIREMENTS FOR RETICULATED SEWERAGE

(1) Reticulated sewerage infrastructure and services must be provided in accordance with the terms of a licence issued by the Economic Regulation Authority, unless the sewerage service provider has an exemption for the reticulated sewerage service which is granted by the Minister for Water under Section 7 of the *Water Services Act 2012*.

(2) Where development is proposed to be connected to a reticulated sewerage scheme, proponents should demonstrate that infrastructure and services can be provided in the manner proposed. The information provided to support the application should be consistent with the requirements outlined in Schedule 1.

(3) Most reticulated sewerage schemes are not designed to accept trade waste, which could pose threats to public health and safety, and the environment. If trade waste cannot be accepted by the sewerage provider, then alternative arrangements will need to be made. Discharge of trade waste to a reticulated sewerage scheme will be subject to strict acceptance criteria as defined in the *Water Services Act 2012*. The sewerage provider may require proponents to:

a) comply with an appropriate permitting scheme;

b) provide a level of on-site treatment of trade waste prior to discharge to the reticulated sewerage scheme; and

d) comply with other alternative arrangements as reasonably required by the sewerage provider.

6.4 MINIMUM REQUIREMENTS FOR ON-SITE SEWAGE DISPOSAL

(1) All proposed lot(s) must be capable of the treatment and disposal of all sewage within a designated land application area within the property boundary of each individual green title lot or survey strata, outside of any applicable public health and environmental setbacks as follows:

a) Separation from groundwater – the discharge point of the on-site sewage disposal system should be at least the following distances above the highest known groundwater level:

– two metres above in public drinking water source areas;

- 1.2 to 1.5 metres, depending on soil type, in sewage sensitive areas; and
- 0.6 to 1.5 m in all other areas, depending on soil type and the type of treatment system used (refer to schedule 3).

b) Within public drinking water source areas, an on-site sewage disposal system should not be located within a wellhead protection zone or on Crown land within a reservoir protection zone. Where this will render existing lots undevelopable, a smaller setback may be considered on a case-by-case basis. Where a wellhead protection zone or reservoir protection zone has not been defined, or existing lots are within these zones, an on-site sewage disposal system should not be located:

- within 100 metres of any bores used for public drinking water supply; or
- within 100 metres of the high water mark of a reservoir or waterway.

c) An on-site sewage disposal system should not be located within 30 metres of a private bore used for household/drinking water purposes.

d) An on-site sewage disposal system should not be located within 100 metres of a waterway. The separation distance should be measured outwards from the outer edge of riparian or wetland vegetation. Setbacks between 30 metres and 100 metres may be considered in low risk situations such as a small (five lots or under) subdivision in consultation with the Department of Water. In the Swan Canning catchment reduced setbacks may be considered on a case-by-case basis in consultation with the Department of Parks and Wildlife.

e) An on-site sewage disposal system should not be located within 100m of a significant wetland. The separation distance for wetlands should be measured outwards from the outer edge of wetland vegetation. Setbacks may also be required from other wetlands identified for protection or rehabilitation through relevant planning or environmental plans or strategies. These will be determined on a case-by-case basis. The Department of Parks and Wildlife may provide advice.

f) An on-site sewage disposal system should not be located within 100 metres of a surface or subsurface drainage system that discharges directly into a downstream waterway or waterbody. Setbacks between 30 metres and 100 metres may be considered on a case-by-case basis (for example low risk situations such as a small [five lots or under] subdivision) in consultation with the Department of Water. In the Swan Canning catchment, reduced setbacks may be considered on a case-by-case basis in consultation with the Department of Parks and Wildlife.

g) An on-site sewage disposal system should not be located within any area subject to inundation and/or flooding in a 10 per cent Annual Exceedance Probability (AEP) rainfall event.

(2) Land with a highest known groundwater level that is less than 0.5 metres below the natural ground level should only be rezoned for urban development where reticulated sewerage will be provided.

(3) Land that is already zoned for urban development may be subdivided and developed in accordance with the provisions of the local planning scheme, provided that the proponent demonstrates that correctly engineered drainage solutions or fill can be used to achieve separation from groundwater required under clause 6.4 (1), subject to such works being environmentally acceptable.

(4) The provision of on-site sewage disposal systems including calculation of land application area shall be in accordance with minimum site requirements contained in Schedule 3.

(5) Development intensification proposals (other than a single house on a single lot) that require the provision of on-site sewage disposal will be assessed on a case-by-case basis.

(6) All on-site sewage disposal systems proposed must be approved for use in Western Australia by the Department of Health.

(7) The type of on-site sewage disposal system used should be determined in response to the site and soil conditions, vulnerability of the receiving environment and the nature of the proposal.

For example:

a) secondary treatment systems with nutrient removal should be used in public drinking water source areas and sewage sensitive areas;

b) where setbacks of less than 100 metres from waterways, drainage systems or marine reserves are proposed, secondary treatment systems with nutrient removal may be required;

c) secondary treatment systems may be required in heavy soils and/or rock;

d) Where lots are less than 2,000m² secondary treatment systems with nutrient removal may be required; and

e) systems dealing with trade waste should be designed to ensure that environmentally hazardous material is not disposed of on site.

(8) Where on-site sewage disposal is to be provided by a secondary treatment system, the Western Australian Planning Commission will require a notification on title pursuant to s. 70A of the *Transfer of Land Act 1893* (as amended) advising that an on-site secondary treatment sewage disposal system and unencumbered area to which treated sewage is to be distributed are required.

(9) Where the Western Australian Planning Commission determines that the absence of reticulated sewerage will affect the use and enjoyment of the land, it may require a notification on the title pursuant to s. 70A of the *Transfer of Land Act 1893* (as amended) advising that no reticulated sewerage is provided and as a consequence, on-site sewage disposal will be required and the developable area of the lot is reduced.

(10) Where secondary treatment systems are proposed, local government should consider its capacity to audit, inspect and enforce compliance with the Department of Health endorsed maintenance schedules and operating standards.

7. IMPLEMENTATION

(1) Compliance with the requirements of this policy does not exempt the applicant from meeting the requirements of other policy, local planning scheme, legislation and/or regulation, nor guarantee approval/endorsement of the proposal by the Western Australian Planning Commission and/or Local Government.

(2) Applications that have received formal planning approval at the time this policy comes into effect can proceed subject to the conditions applicable at the time of the approval, including the Government Sewerage Policy at that time, for as long as that approval remains valid.

(3) To ensure uniform application of this policy, statutory and referral agencies will utilise the policy as follows:

a) Local Government in the determination of development proposals and in the provision of advice to the Western Australian Planning Commission on capability to accommodate on-site sewage disposal;

b) Department of Health in the provision of advice on health and hydraulic loading matters, including where required, the adequacy of soil and site evaluations;

c) Department of Water, in the provision of advice on water resources, including sewage sensitive areas and public drinking water source areas;

d) Department of Parks and Wildlife in the provision of advice on environmental values, including sewage sensitive areas, parks and reserves, specially protected wildlife, ecological communities and significant wetlands and; in performing its statutory planning functions for the Swan Canning river system;

e) Department of Environment Regulation in the provision of advice related to trade waste and the disposal of treated wastewater from wastewater treatment plants;

f) Western Australian Planning Commission in the determination of planning proposals and the provision of advice to the Minister for Planning; and

g) sewerage service providers in the provision of advice related to the connection to infrastructure and acceptance of sewage (including trade waste) in accordance with the *Water Services Act 2012*.

(4) The decision-making authority should forward proposals to relevant environmental, health and planning personnel within State and/or local government for comment and/or assessment.

7.1 INFORMATION TO SUPPORT PLANNING APPLICATIONS

(1) It is the applicant's responsibility to provide supporting information to demonstrate that a site is suitable for long-term sewage disposal. The information provided should be commensurate to the scale and nature of the proposal.

(2) Proposals for reticulated sewerage should be supported by the information outlined under Schedule 1.

(3) Proposals for on-site sewage disposal should be supported by the information outlined under Schedule 2.

SCHEDULE 1:
SUPPORTING INFORMATION AND REQUIREMENTS WHERE RETICULATED SEWERAGE IS PROPOSED

The *Water Services Act 2012* requires reticulated sewerage services to be operated in accordance with a 'Water service operating licence', which is issued by the Economic Regulation Authority (ERA), unless a licensing exemption has been granted by the Minister for Water under Section 7 of that Act. Planning proposals should be supported with information outlined below to demonstrate that future development will be serviced appropriately.

1.1 CONNECTION TO AN EXISTING OR PLANNED RETICULATED SEWERAGE SCHEME

Subdivision approval subject to the following conditions may be issued.

(1) Arrangements being made with the (insert service provider) so that the provision of a reticulated sewerage service will be available to the lots shown on the approved plan of subdivision.

(2) The reticulated sewerage service being connected to an operational wastewater treatment system. (WAPC)

a) Advice notes –

i) In regard to Condition (INSERT VALUE), The Western Australian Planning Commission will only clear these conditions upon written confirmation that:

– the works required to provide a reticulated sewerage service have been completed to the satisfaction of the wastewater service provider.[1]

1.2 CONNECTION TO RETICULATED SCHEME THAT IS YET TO BE ESTABLISHED

Where it is proposed that new lots will be connected to a reticulated sewerage scheme that is not yet established, the following information and supporting documentation should be provided at the following stages of the planning process.

1.2 (a) Rezoning and local structure plan

Any application for rezoning in region or local planning schemes (including the lifting or urban deferment) and any local structure plan should be accompanied by the following.

(1) Details of:

a) Proposed wastewater treatment system including –

i) method of treatment and disposal (technology and operation);

ii) land required for sewerage infrastructure (indicative area and location). Where the wastewater treatment plant is not located within the application boundary, the applicant is to provide information to demonstrate how access to the plant will be secured;

iii) preliminary buffer requirements, including impact on neighbouring properties; and

iv) potential environmental issues and management.

b) Trade waste, if applicable.

1 Temporary servicing arrangements in public drinking water source areas are not acceptable. i.e. tankering/carting of sewage as an interim measure will not satisfy the condition.

(2) Water balance (total water requirements, reuse and disposal), including stage of development at which the wastewater treatment plant will become operational.

(3) Details of required regulatory approvals and timing for lodgement of applications.

(4) Identification of potential service provider. It is acknowledged that it is generally not feasible to obtain a water services licence in the early stages of the planning process.

The requirement to connect future development to a reticulated sewerage scheme operated by a licenced or exempted service provider should be included via provisions in the local planning scheme.

The provision of sewerage services in only one of a number of planning considerations relevant to the lifting of urban deferment. The assessment of proposals to lift urban deferment will consider the sequential expansion of the urban front in accordance with orderly and proper planning.

1.2 (b) Subdivision

Any subdivision application should include the following information. Information is to be provided in support of the application rather than as a condition of subdivision.

(2) Details of proposed sewage disposal system including:

  a) Method of treatment and disposal (technology and operation).

  b) Land required for sewerage infrastructure (specify area and location). Where the wastewater treatment plant is not located within the application boundary, the applicant is to provide information to demonstrate how access to the plant will be secured.

  c) Buffer requirements, including impact on neighbouring properties.

  d) Potential environmental issues and management.

(3) Details and timing for regulatory approvals.

(4) Identification of service provider. It is acknowledged that it may not be feasible to obtain a water services licence until after subdivision approval.

(5) Construction, operation and staging considerations, including stage of development at which the wastewater treatment plant will become operational.

(6) Subdivision approval subject to the following conditions and advice notes may then be issued:

  a) Conditions –

    i) arrangements being made with a licenced or exempted wastewater service provider so that the provision of a reticulated sewerage service will be available to the lots shown on the approved plan of subdivision; (WAPC) and

    ii) the reticulated sewerage service being connected to an operational wastewater treatment system.[2] (WAPC)

  a) Advice notes –

    Ii) in regard to Condition (INSERT VALUE), The Western Australian Planning Commission will only clear these conditions upon written confirmation that:

      – the reticulated sewerage service has been provided in accordance with a licence issued by the Economic Regulation Authority, or a licencing exemption granted by the Minister for Water;

      – the works required to provide a reticulated sewerage service have been completed to the satisfaction of the wastewater service provider.

2 Temporary servicing arrangements in public drinking water source areas are not acceptable. i.e. tankering/carting of sewage as an interim measure will not satisfy the condition.

SCHEDULE 2:
SUPPORTING INFORMATION FOR PLANNING APPLICATIONS WHERE ON-SITE SEWAGE DISPOSAL IS PROPOSED

It is the applicant's responsibility to provide information to demonstrate that a site is suitable for long-term on-site sewage disposal. This can be achieved through the following investigations and information at the various stages of the planning system. The level of information provided should be commensurate with the scale and nature of planning proposal. Where a water management plan or strategy is required and prepared in accordance with *Better Urban Water Management* (WAPC 2008), as may be amended from time to time), information about long term on-site sewage disposal should be incorporated into the water management plan or strategy.

2 (a) LOCAL PLANNING STRATEGIES AND SUBREGIONAL/DISTRICT PLANS

Identification of factors including the following:

- Public drinking water source areas.
- Sensitive receiving environments including –
    - sewage sensitive areas, as defined in section 4 of this policy;
    - wetlands that are classified as resource enhancement;
    - marine reserves;
    - karst systems.
- Sewerage servicing options for future growth areas.
- Major infrastructure requirements.
- Opportunities for recycled and alternative water supplies and fit-for-purpose use and management, particularly in areas where supply for public open space irrigation is limited.

2 (b) REZONING AND STRUCTURE PLANNING

Any application to rezone land through region or local planning scheme amendments and any local structure plan should be accompanied by the information outlined below. The level of detail should be sufficient to demonstrate the capability of the land to sustain the proposed land uses being serviced by on-site sewage disposal without impacting on public health, amenity or the environment.

Relevant information should be incorporated into scheme amendment reports and structure plan reports, as well as district and local water management plans prepared in accordance with *Better Urban Water Management* (WAPC 2008). The details may be presented as part of the report or water management plan or as a standalone document.

Compliance with policy requirements for on-site sewage disposal

Plans and supporting information should be provided to demonstrate that future development is capable of accommodating on-site sewage disposal in accordance with section 6.2 and section 6.4 of this policy, including:

- identification of any land within a public drinking water source area or a sewage sensitive area;
- landform and soils;
- setbacks from waterways, wetlands, dams, drains, bores and marine reserves;
- identification of land subject to flooding; and
- proximity to reticulated sewerage (established and planned).

Best practicable servicing option

Demonstration that on-site sewage disposal is the best practicable servicing option for the local area. This should include:

- overview of reticulated and on-site servicing options in conjunction with advice from local sewerage service provider;
- demonstration that on-site sewerage servicing will not result in unacceptable cumulative environmental, public health, administrative or land use planning impacts.
    - Environmental impact –
        - estimate the nutrient inputs associated with on-site sewage disposal (estimated number of unsewered lots x nutrient load per lot)
        - identify sensitive receiving environments, including:
            - wetlands that are classified as resource enhancement
            - marine reserves
            - karst systems
        - outline potential and cumulative impacts upon sensitive receiving environments associated with nutrients and other contaminants and measures in place to manage impacts[3].
- Administrative impact –
    - Advice from local government regarding its capacity to deal with the administration of on-site sewage treatment systems for the estimated number of unsewered lots. This is particularly important where secondary treatment systems are required.
- Land use planning impact –
    - Identify if the lack of reticulated sewerage will restrict opportunities to intensify land uses in the future, particularly where they are provided for in the local planning strategy or local planning scheme.

Where approval of the rezoning or structure plan may reduce the likelihood of providing reticulated sewerage to the local area, the cumulative environmental, administrative and land use planning impacts should be considered. The impacts should be based on an estimation of the number of unsewered lots likely to be developed in the local area as identified in the local planning strategy and/or local planning scheme.

3 Environment quality targets are outlined in management plans for Marine Reserves

Site and soil evaluation	Site and soil evaluation in compliance with *AS/NZS 1547 On-site domestic wastewater management*, which includes details of: ● soil type and depth to water table[4]; and ● any likely vegetation clearing, buffer requirement and/or site earthworks. The scale and nature of the evaluation should be proportionate to the level of risk associated with a proposal. For example, large scale proposals with significant site or environmental constraints will require more detail than small scale proposals with minimal site or environmental constraints.
Proposed servicing strategy	Proposed servicing strategy for water supply, sewage management and stormwater management and sewage treatment system requirements to address the findings of the site and soil evaluation. Describe the stormwater management strategy including areas required for management of major rainfall events and the strategy to manage minor and frequent rainfall events.
Additional information where secondary treatment systems are proposed	Outline the regulatory and institutional arrangements that will be in place to ensure the installation, operation, maintenance and monitoring requirements associated with the on-site sewage systems are met, including capacity of local government to ensure systems are installed and maintained correctly.
Additional information requirements non-residential land uses that will generate trade waste	Identify the risks associated with disposal of sewage (including trade waste) and how these risks will be managed including: ● the types of land uses to be permitted and contaminants likely to be present; ● vulnerability of the receiving environment; ● proposed method of disposal and measures to address risk; ● details of staging and/or other risk factors where relevant; and ● advice and acceptance by the sewerage service provider.
Proposals within 50 metres of Declared Rare Flora	*Note*: on-site sewage disposal systems have the potential to affect native flora species. Declared Rare Flora (DRF) are protected under the *Wildlife Conservation Act 1950 (WC Act 1950)*. The taking of DRF is prohibited unless an application is approved under the *WC Act 1950*. The Department of Parks and Wildlife recommends proponents consider applying for a DRF permit if there is any activity within 50 metres of DRF that has the potential to impact upon the flora species.

4 Information on soil permeability and suitability for liquid waste disposal for the Perth metropolitan region (Yanchep to Serpentine) is shown on the Metropolitan environmental geology map series produced in the 1980s by the Geological Survey division of the Department of Mines, and on the Department of Agriculture and Food (WA) land resources mapping series. Broad information on depth to groundwater is provided in the Perth groundwater Atlas available on the Department of Water website (www.water.wa.gov.au).

2 (c) SUBDIVISION

Any application for subdivision which proposes the use of an on-site sewage disposal system should provide detailed design information regarding the proposed on-site sewage disposal system, including but not limited to the information outlined below. Except where noted otherwise, this information is to be provided when lodging the application rather than as a condition of subdivision.

Relevant information should be incorporated into urban water management plans prepared in accordance with *Better Urban Water Management* (WAPC 2008). The details may be presented as part of the water management plan or as a standalone document.

Compliance with policy requirements for on-site sewage disposal

Supporting information should be provided to demonstrate that future development is capable of accommodating on-site sewage disposal in accordance with section 6.2 and section 6.4 of this policy, including:

- proximity to reticulated sewerage;
- identification of any land within a public drinking water source area or a sewage sensitive area or subject to flooding from any rainfall event greater than the 10 per cent annual exceedance probability event;
- landform and soils;
- highest known groundwater depth and gradient; and
- an indicative lot layout plan to demonstrate that the proposed lots are of a sufficient size to accommodate:
    - apparatus for the treatment of sewage
    - an unencumbered land application area required to distribute treated sewage
    - on-site stormwater soak wells and setbacks
    - dwellings, outbuildings and associated setbacks
    - paved surfaces, including driveways
    - setbacks from waterways, wetlands, dams, drains, bores and marine reserves.

A site and soil evaluation will be required prior to subdivision approval being issued for the creation of lots less than 1,000m^2, or any other instance where the decision maker, on the advice of referral agencies, has reason to question the site's capacity to accommodate on-site sewage disposal without impacting on public health, amenity or the environment. This is likely to include subdivision in localities where public health issues associated with on-site sewage have been reported or where a large number of lots is proposed.

In other instances, conditional subdivision approval subject to the following condition may be issued:

> *Prior to the commencement of subdivisional works, the landowner/ applicant is to provide a site and soil evaluation in compliance with Australian/New Zealand Standard 1547: On-site domestic wastewater management certifying that the land is physically capable of accommodating on-site sewage disposal.*

Where lots greater than 1,000m^2 are proposed and the local government has a good understanding of the soil and site conditions and the on-site treatment system proposed is known to perform well under local conditions, a site and soil assessment may not be required.

Site and soil evaluation	Site and soil evaluations should be in compliance with *AS/NZS 1547 On-site domestic wastewater management*, which includes ● geotechnical report which describes soil type and depth to water table; and ● details of any likely vegetation clearing, buffer requirement and/or site earthworks. o The scale and nature of the evaluation should be proportionate to the level of risk associated with a proposal. For example, large scale proposals with significant site or environmental constraints will require more detail than small scale proposals with minimal site or environmental constraints.
Proposals for non-residential subdivision	Demonstrate that the lots proposed have sufficient capacity to treat and dispose of sewage and contain associated buffers on-site. This should include the following information: ● the expected hydraulic load (calculated in accordance with the *Code of Practice for On-site Sewage Management*) of sewage generation and Table 2 of the *Supplement to Regulation 29 and Schedule 9 – Wastewater System loading rates* (Department of Health, 2015); ● a water balance analysis including trade waste; ● the size of the land application area should be determined in accordance with the conversion factors prescribed in Table 3 contained in Schedule 3; ● risks associated with disposal of sewage, including trade waste, including type of land uses permitted and contaminants associated with the land uses; vulnerability of receiving environment and water resources and any other risk factors; and ● the proposed apparatus, method of disposal and measures to address risk; *Note*: Trade waste may contain a range of environmentally hazardous materials that must not be discharged to the environment (refer to the *Environmental Protection (Unauthorised Discharges) Regulations 2004; Environmental Protection (Controlled waste) Regulations 2004 and Supplement to Regulation 29 and Schedule 9 – Wastewater system loading rates (Department of Health, 2015).*
Proposals within 50 metres of Declared Rare Flora	Note: on-site sewage disposal systems have the potential to affect native flora species. Declared Rare Flora (DRF) are protected under the *Wildlife Conservation Act 1950 (WC Act 1950)*. The taking of DRF is prohibited unless an application is approved under the *WC Act 1950*. The Department of Parks and Wildlife recommends proponents consider applying for a DRF permit if there is any activity within 50 metres of DRF that has the potential to impact upon the flora species.

2 (d) DEVELOPMENT

Any application for development which proposes the use of on-site sewage disposal systems should be consistent with the Department of Health's *Code of Practice for On-site Sewage Management* and be supported by the following information.

Site plan	Site plan to demonstrate that the proposed lot is of a sufficient size to accommodate: ● features of the site including remnant vegetation cover, any existing sewage management system; ● areas that are subject to inundation or flooding from any rainfall event greater than the 10 per cent annual exceedance probability (AEP) event; ● existing and proposed buildings and paved surfaces including driveways, verandas and alfresco areas; ● sewage treatment apparatus and setbacks prescribed under *Code of Practice for On-site Sewage Management;* ● unencumbered land application areas to which effluent is disposed and setbacks prescribed under *Code of Practice for On-site Sewage Management*; ● setbacks from waterways, wetlands, dams, drains and bores; ● on-site stormwater management areas (e.g. soak wells) and setbacks prescribed by the *National Construction Codes*; ● rainwater tanks where appropriate; and ● reserve areas where appropriate.
Site and soil evaluation	Details of investigation of soil strata and depth to groundwater undertaken in accordance with *AS/NZS 1547 On-site domestic wastewater management.* Where the local government has a good understanding of the soil and site conditions and the on-site treatment system proposed is known to perform well under local conditions, a site and soil assessment may not be required.
Proposed servicing strategy	● Description of the types and quantities of sewage that will be generated or disposed of as a result of all uses on the site. This should include an estimate on the total number of persons per day to be accommodated on the site. ● Details of the on-site disposal system to be installed including the location, type and performance of the system; any setbacks prescribed under the *Code of Practice for On-site Sewage Management*; and the area proposed for disposal, demonstrating that this is sufficient to distribute the effluent and address nutrient risks. ● The size of the land application area should be determined in accordance with the conversion factors prescribed in *Table 4* contained in Schedule 3. ● Proposed method of stormwater management. A stormwater management plan may be required for large scale proposals. ● Maintenance plan outlining planned operational and equipment maintenance procedures outlined in a long term plan which includes roles, responsibilities and timing. *Note:* Systems for the treatment of sewage must be approved by use by the Department of Health.

Additional information required for non-residential development that will generate trade waste	• Details of the type and quantities of trade waste likely to be generated, including environmentally hazardous material; • Details of the proposed method of disposal of trade waste; • Details of any contingency measures proposed to minimise the impacts of chemical spills and safely dispose of contaminated waters that may result from storms, fire, flood or equipment malfunction or vandalism. Information should include workforce training, site monitoring and emergency response facilities and protocols appropriate to the level of risk from the proposed use. *Note*: Trade waste may contain a range of environmentally hazardous materials that must not be discharged to the environment (refer to the *Environmental Protection (Unauthorised Discharges) Regulations 2004* and *Environmental Protection (Controlled waste) Regulations 2004*).
Proposals within 50 metres of Declared Rare Flora	*Note*: on-site sewage treatment systems have the potential to affect native flora species. Declared Rare Flora (DRF) are protected under the *Wildlife Conservation Act 1950 (WC Act 1950)*. The taking of DRF is prohibited unless an application is approved under the *WC Act 1950*. The Department of Parks and Wildlife recommends proponents consider applying for a DRF permit if there is any activity within 50 metres of DRF that has the potential to impact upon the flora species.

SCHEDULE 3:
SITE REQUIREMENTS FOR ON-SITE SEWAGE DISPOSAL SYSTEMS

MINIMUM LOT SIZES FOR RESIDENTIAL DEVELOPMENT IN HEAVY SOILS.

Table 1: Minimum lot sizes for residential development serviced by on-site sewage disposal in heavy soils located outside public drinking water source areas and sewage sensitive areas.

Soil category[5]	Soil texture	Minimum lot sizes m2 (R-code)[6]	
		Primary treatment	Secondary treatment
4	Clay loams	2,000 (R5)	1,000 (R10)
5	Light clays	4,000 (R2.5)	1,000 (R10)
6	Medium to heavy clay	Special design requirements and distribution techniques or soil modification procedures will be necessary. Refer to Table L1 of AZ/NZS 1547 for more details.	2,000 (R5)
-	Rock	Special design requirements and distribution techniques or soil modification procedures will be necessary.	

LAND APPLICATION AREAS FOR SINGLE HOUSES

Table 2: Land application areas for single houses

Soil category	Soil texture	Land application area (m^2)[7]	
		Primary treatment	Secondary treatment
1	Gravels and sands	339	180
2	Sandy loams	339	180
3	Loams	429	225
4	Clay loams	620	257
5	Light clays	1,156	300
6	Medium to heavy clays	Special design	450

A sample calculation for determining the land application area for a primary treatment system in Soil Categories 1 and 2 is provided in the Explanatory Notes.

5 Soil categories, extrapolated from Table 5.1 *AS/NZS 1547*, are to be determined by undertaking a site and soil evaluation (SSE) as per *AS/NZS 1547* On-site domestic wastewater management.

6 Minimum lot sizes are based upon area required to accommodate dwelling, primary sewage treatment apparatus, land application areas and associated setback distances.

7 The land application area has been determined using design loading rates for trenches and beds, extrapolated from Table L1 AZ/NZS 1547 *On-site domestic wastewater management*. Calculations used a hydraulic loading of 900litres/day, which is based on the occupancy of 6 persons in a 5 bedroom house and a sewage design flow of 150L/person/day. Values for primary treatment include setback distances. Note that values for secondary treatment exclude setback distances, which will vary depending on the system used.

GENERAL SITE FEATURES FOR ON-SITE SEWAGE DISPOSAL

Table 3: General site features for on-site sewage disposal

Site feature	Minimum requirement
Separation from groundwater – outside public drinking water source areas and sewage sensitive areas **(The minimum requirements for public drinking water source areas and sewage sensitive areas are found at Section 6.4 of this policy)**	Where land is not within a Public Drinking Water Source Area or a sewage sensitive area[8], the discharge point of the on-site sewage disposal system should be located the following distances above the highest known groundwater level: ● For loams and heavy soils, the base of the proposed land application system should have a depth of at least 0.6 metres above the highest seasonal post development water table. ● For gravels, the base of the proposed land application system should have a depth of at least one metre above the highest seasonal post development water table. ● For sands the base of the proposed land application system should have a depth of at least 1.5 metres above the highest seasonal post development water table. ● Where a nutrient retentive secondary treatment system will be used, the proposed land application system should have a depth of at least 0.6 metre above the highest seasonal post development water table.
Land application area	Depending on the soil type, a land application area should be provided for all development in accordance with tables 2 and 4 of this schedule for the disposal of sewage.
	The land application area excludes the area required for the apparatus. It should be kept free of any temporary or permanent structures.
	Activities within the land application area shall not interfere with the function of the current and future land application system and people should avoid potential contact with effluent residues. Unless allowed for in the design, the land application area (which does not include the apparatus) should: ● not be built on or paved in a manner which precludes reasonable access; ● not be subject to vehicular traffic (other than a pedestrian-controlled lawnmower); ● not be subject to regular foot traffic such as pathways and clothes line areas; and ● should be kept in a manner which enables servicing and maintenance of the disposal system.
Gradient of the land application area	Where slope exceeds one in five (1:5), the land application area should be engineered to prevent run-off from the land application area. Surface contours should be provided on the site plan.

8 The minimum separation distances for sewage sensitive areas and public drinking water source areas are provided in Section 6.4 of this policy.

DETERMINATION OF LAND APPLICATION AREA (M2) FOR DEVELOPMENT/SUBDIVISION

The size of the land application area should be determined in accordance with the conversion factors prescribed in Table 4 and *AS/NZS 1547* On-site domestic wastewater management as follows:

1. Estimate hydraulic load (L/day):
   - occupancy rate (persons) x design loading rate (L/person/day)
2. Calculate land application area *(m^2)*:
   - hydraulic load (L/day) x conversion factor from Table 4

Table 4: Conversion factors to calculate the minimum required land application area for subdivision/ development (conversion factors are determined using a hydraulic load of 1 L/day.

Soil category	Soil texture	Conversion factors	
		Primary treatment	Secondary treatment
1	Gravels and sands	0.377	0.2
2	Sandy loams	0.377	0.2
3	Loams	0.477	0.25
4	Clay loams	0.689	0.286
5	Light clays	1.284	0.333
6	Medium to heavy clays	Special design requirements and distribution techniques or soil modification procedures will be necessary	0.5

SCHEDULE 4:
LOCALITIES OUTSIDE PERTH METROPOLITAN AREA AND PEEL REGION WITH ESTABLISHED RETICULATED SCHEMES (AS AT 1/2/2016)

Albany
Augusta
Australind
Beverley
Binningup
Boddington
Bootenall
Boulder
Boyanup
Bremer Bay
Bridgetown
Brookton
Broome
Brunswick
Bunbury
Burekup
Busselton
Calingiri
Capel
Carnarvon
Cervantes
Christmas Island
Cocos Island
Collie
Coolgardie
Coral Bay
Corrigin
Cowaramup
Cranbrook
Cunderdin
Dalwallinu
Dampier
Dardanup
Denham
Denison
Denmark
Derby
Dongara
Donnybrook
Dowerin
Dumbleyung
Dunsborough
Eaton
Emu Point
Eneabba
Esperance
Exmouth
Finucane Island
Fitzroy Crossing
Geraldton
Gnarabup
Gnowangerup
Goomalling
Greenhead
Greenough
Halls Creek
Harvey
Hopetoun
Horrocks
Hyden
Jerramungup
Jurien Bay
Kalbarri
Kalgoorlie
Kambalda
Karratha
Katanning
Kellerberrin
Kojonup
Koolyanobbing
Koorda
Kulin
Kununurra
Lake Argyle
Lake Grace
Lancelin
Laverton
Ledge Point
Leeman
Leinster
Leonora
Lower King
Manjimup
Margaret River
Marvel Loch
Meckering
Merredin
Moora
Morawa
Mount Barker
Mukinbudin
Mullewa
Nannup
Narembeen
Narrogin
Newdegate
Newman
Norseman
Northam
Nyabing
Ongerup
Onslow
Pannawonica
Paraburdoo
Pemberton
Picton
Pingelly
Pingrup
Port Hedland
Prevelly
Quairading
Quindalup
Ravensthorpe
Roebourne
Seabird
South Hedland
Southern Cross
Tambellup
Three Springs
Tom Price
Toodyay
Wagin
Walpole
Waroona
Wickepin
Wickham
Williams
Wiluna
Wongan Hills
Wundowie
Wyalkatchem
Wyndham
Yerecoin
York