

# Wastewater treatment plants and the South Australian planning system

Updated September 2016

*EPA1086/16: This guideline will assist planning authorities and proponents of development understand the position of the Environment Protection Authority (EPA) on wastewater treatment plants (WWTP) and the South Australian planning system.*

## Introduction

This guideline describes:

- the EPA's position on changes to the South Australian planning strategy or Development Plan Amendments (DPA) that may result in the creation of interface issues (air and noise impacts) with a WWTP or require management of treated wastewater
- the EPA's position on the identification and consideration of WWTP essential infrastructure requirements during the preparation of strategic directions reports
- the EPA's position on any WWTP development applications that are referred to the EPA in accordance with Schedules 8, 21 and 22 of the *Development Regulations 2008*
- minimising the environmental impacts of new WWTP
- the relationship between development applications under the *Development Regulations 2008* and licensing under the *Environment Protection Act 1993*.

For the purposes of this document a WWTP is a facility that treats residential grey water and sewage, and liquid waste from industrial and agricultural processes. A WWTP includes community wastewater management systems that remove septic tank effluent.

This guideline applies to active (mechanical) and passive (lagoon or wetland) WWTP systems.

## Proper assessment of wastewater treatment plants

Wastewater management processes have the potential to expose sensitive land uses<sup>1</sup> to unacceptable air emissions and/or noise. A WWTP may generate odour from the wastewater treatment process and sludge handling, and noise emissions from mechanical transport onto site, audible alarms and other noise sources

The impacts from odours can vary from being just detectable to levels that can cause nuisance and become objectionable and offensive. The main effect of environmental odour is nuisance, but stronger or persistent odours can lead to feelings of nausea, headache, loss of sleep and other symptoms of stress. Repeated exposure to nuisance levels of odour can lead to a high level of annoyance. While some people may become accustomed to odours, others may become sensitised to them.

Noise is an inherent part of most activities, but may become annoying if it intrudes into people's awareness or is heard against their wishes. An introduced noise that disturbs a person's everyday life or working environment can be very annoying or harmful, and may cause adverse health effects due to sleep disturbance, and affect wellbeing.

WWTPs may produce treated wastewater that could have a detrimental impact on water quality if not managed appropriately. The primary water quality issue that requires management is the discharge of treated wastewater to surface and marine waters, and uncontrolled discharge (in the form of spills, leaks, overflows) causing impacts to surface or ground water.

The EPA works through the planning system to protect South Australian waters from the adverse impacts of pollution such as discharge from a WWTP that might reduce their value to current and future generations.

The state's water resources support a diverse range of ecosystems, including wetlands along the River Murray, creeks in the Mount Lofty Ranges and the groundwater resources of the South East. In addition, the marine ecosystems are unique and among the most biologically diverse in the world, with many endemic species, and internationally and nationally important species.

## The EPA's role in assessment of WWTP planning matters

The major components of the South Australian planning system—Planning Strategy, Development Plans, development application, and major development or project—are interconnected and the system is regulated through the *Development Act 1993* and the *Development Regulations 2008*.

Within this framework the EPA provides advice on proposed changes to the Planning Strategy and Development Plans, and assesses and advises or directs on referred development applications and major development or project applications.

The South Australian planning system provides the opportunity to ensure that a proposed land use area (such as a Residential Zone) or a new WWTP are located or designed in such a way that the community is not exposed to odour or noise from wastewater management processes and that treated wastewater is appropriately managed.

Through the planning system the EPA provides advice or direction on matters relating to WWTP to reduce potential detrimental impacts to the environment, including environmental nuisance that may be caused to sensitive land uses.

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<sup>1</sup> Sensitive land uses include, but are not limited to, residential housing, childcare centres, educational institutions, hospitals, nursing homes and retirement villages, parklands and recreation areas, tourism accommodation. Industrial and commercial premises can also be affected by noise and air emissions – [Evaluation Distances for Effective Air Quality and Noise Management](#) (2016).

## South Australian Planning Strategy

At the Planning Strategy stage the EPA will have an interest in the location of land identified for future development of wastewater management systems or sensitive land uses, and in ensuring that high-level planning policy in respect of wastewater management is incorporated into the various volumes of the Planning Strategy.

When an amendment to the South Australian Planning Strategy is prepared it is the EPA's position that:

- key development areas identified for establishment of a WWTP or development of sensitive land uses will not create land use conflicts through exposure of sensitive land uses to unacceptable odour and noise.
- principles and policies that reference WWTP, including appropriate separation from sensitive land uses, and avoidance or minimisation of wastewater generation, recycling, and reuse opportunities, are included to enable further consideration and expansion of those principles and policies in other levels of the planning system.

## Strategic Directions Report

When reviewing a Strategic Directions Report the EPA will examine any proposed amendments to the Development Plan that may involve development in respect of a WWTP. It will also review a council's priorities for infrastructure planning where that infrastructure is for the purpose of wastewater management.

When a Strategic Directions Report is prepared it is the EPA's position that:

- future DPAs involving WWTP be identified
- master planning for future wastewater management infrastructure requirements be undertaken within the context of the future land use and the disposal needs of the wider surrounding area.

## Development Plan Amendment (DPA)

At this stage the EPA will have an interest in proposed changes to planning policy or rezoning of land that could result in land use conflicts through exposure of sensitive land uses to unacceptable odour and noise from a WWTP.

It is the EPA's position that when changes to planning policy or rezoning of land are proposed through the DPA process:

- key development areas identified for establishment of a WWTP or development of sensitive land uses will not create land use conflicts through exposure of sensitive land uses to unacceptable odour and noise from WWTP
- the Statement of Intent proposes to investigate any potential issues associated with air quality, noise, and the management of treated wastewater in accordance with the waste management hierarchy<sup>2</sup>; if not the EPA will recommend additional investigations that should be undertaken

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<sup>2</sup> *Waste management hierarchy*, as described in the *Zero Waste SA Act 2004*, refers to an order of priority for the management of waste, being: avoidance of the production of waste, minimisation of the production of waste, reuse of waste, recycling of waste, recovery of energy and other resources from waste, treatment of waste to reduce potentially degrading impacts, and disposal of waste in an environmentally sound manner.

- the DPA proposes policy for inclusion in the development plan, or there is existing policy in the development plan, that:
  - avoids or mitigates adverse air quality and noise impacts arising from wastewater management.
  - enables the proper management of treated wastewater, including the application of the waste management hierarchy.

The inclusion of such a policy enables the proper assessment of air quality and noise impacts, and management of treated wastewater at the development application stage.

## Development application and major development

In accordance with Schedules 8, 21 and 22 of the *Development Regulations 2008*, a development application for a WWTP is referred to the EPA for assessment. A development application for a land division near to a WWTP may also be referred to the EPA.

At the development application or major development or project stage, the interest of the EPA is in whether the development would expose sensitive land uses to unacceptable odour or noise from a proposed or existing WWTP, and how treated wastewater from any proposed WWTP would be managed.

When a development application is prepared for a wastewater management system or any major development or project involving a wastewater management system, or for a land division near to an existing wastewater management system or one that would require wastewater management, it is the EPA's position that:

- best available technology economically achievable (BATEA) be used for the management and control of air, noise and water emissions where appropriate
- the proposed development not create land use conflicts through exposure of sensitive land uses to unacceptable odour and noise from WWTP
- in accordance with the waste management hierarchy, generation of wastewater is avoided or minimised and reuse and recycling opportunities are applied

The EPA supports the use of decentralised WWTPs as a means of implementing the waste management hierarchy<sup>3</sup>.

A decentralised WWTP is a facility built specifically to service a particular development, rather than wastewater from the development being transferred to existing infrastructure. A large centralised system can be cost effective and may result in fewer air and noise pollution and amenity issues for the surrounding region when compared to multiple smaller decentralised systems. However, in many cases a more sustainable outcome can be achieved through building a new smaller decentralised system designed for 100% reuse rather than, for example, connecting to a large plant that discharges to surface waters.

Should a decentralised plant be proposed as part of a development, agreement should be made between the council and developer as to which party will have responsibility for future management of the plant as follows:

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<sup>3</sup> This position supports Action 20 of the *Water for Good (2010)* plan: 'Encourage decentralised wastewater recycling schemes in new developments, in partnership with the implementation of the Plan for Greater Adelaide', The *30-year Plan for Greater Adelaide (2010)* contains policy requiring 'new greenfield developments that are subject to Structure Plans from 2011 to source water for outdoor use from non-mains water supplies. This recognises the need to plan alternative water sources at the commencement of new large greenfields developments, rather than retrofit these sources for latter stages of the development' (Water Policy 4).

- Treatment proposals consider the customer and service base (ie the source of the wastewater) and ensure treatment protocols suit the type of waste stream whether it be residential, a variety of industrial sources or a mixture of both, and consider the likely effluent flow.

Wastewater should be sufficiently treated with appropriate quality control, ensuring it is fit for purpose. This is relevant to existing plants and new plants servicing existing network infrastructure. Seasonality and potential for stormwater ingress and high rainfall events should also be considered to ensure the plant has the capacity to manage the influx. Consideration should be given to the quality of the wastewater and whether a high salinity or low salinity plant is necessary to ensure wastewater is sufficiently treated with appropriate quality control and is fit for purpose.

- Consideration be given to future land uses and the disposal needs of the wider surrounding area.

If an area will potentially be rezoned or subdivided, the capacity of a WWTP to cope with additional wastewater volumes and pollutant loads, as well as associated odour and noise issues must be considered. The capacity of existing facilities to manage potential volumes will need to be addressed in order to prevent future mismanagement and possible pollution.

- Sustainable recycled water use be implemented to avoid discharge to surface or underground waters.

Where discharge is proposed, treatment should incorporate best available technology economically achievable (BATEA). The treatment technology should be regularly reviewed and updated, delivering continuous improvement to discharge water quality. Controlled discharge is licensed and managed to ensure impacts to the receiving environment are appropriately minimised.

- Low-energy wastewater management systems be implemented in preference to high-energy wastewater management systems.

Wastewater treatment can include active, mechanical technologies and/or passive, wetland systems. In general, the EPA promotes the use of best practices and achievement of the lowest energy footprint possible. The low energy objective tends to favour passive treatment systems that can achieve the environmental outcomes required, treating water to an appropriate quality with compliance of air quality and noise criteria.

- Changes to existing activities demonstrate a net environmental benefit to the receiving environment, increasing the quality of wastewater.

Alteration to operation and plant processes that may result in an increase in emissions, discharge or variation to pollutants may require a development approval. The EPA would, depending on the scale and location, provide advice or direction on such development applications.

## Addressing air and noise emissions, and water quality

The following information on air and noise emissions, and water quality is for the use of consultants preparing an application for, or a planning authority undertaking an assessment of, a WWTP development or development that would create an interface between a WWTP and a sensitive land use.

Failure to provide this information in a clear form will prolong the assessment process.

### Air and noise emissions

To ensure that odours and noise do not have a detrimental impact on nearby sensitive land uses, sufficient separation needs to be maintained between a WWTP and those sensitive land uses.

The EPA's [Evaluation distances for effective air quality and noise management](#) (2016) identifies recommended evaluation distances between sensitive land uses and polluting activities, within which potential adverse impacts on the sensitive land uses need to be assessed. Application of the guideline is intended to assist in protecting amenity in residential and other sensitive areas as well as protecting existing industry from encroachment by sensitive land uses.

The EPA expects an appropriate separation distance would be maintained between a WWTP and sensitive land uses to prevent adverse impacts from air and noise emissions.

At the development application stage it will need to be demonstrated that the recommended evaluation distance can be maintained between sensitive land uses and an existing or proposed wastewater treatment plant. If a lesser separation distance is proposed, it will need to be demonstrated there would be no negative impacts on sensitive land uses in the surrounding area. It may be necessary to show that odour criteria identified in the Air Quality Policy can be met<sup>4</sup>. An environmental noise assessment may be required in the form of an acoustic report that demonstrates the *Environment Protection (Noise) Policy 2007*, general environmental duty, and any relevant Australian Standards would be able to be achieved.

If not provided with the development application the EPA may seek further information in the form of modelling or monitoring to ensure statutory requirements are met.

## **Water quality**

The *Environment Protection (Water Quality) Policy 2015* (WQ Policy) has several provisions that collectively serve to protect South Australian water quality, such as compliance with:

- the waste management hierarchy
- wastewater lagoon management
- the general environmental duty of the *Environment Protection Act 1993*, to prevent or minimise environmental harm resulting from undertaking an activity that pollutes or might pollute waters.

The WQ Policy also makes clear (in the context of the general environmental duty requirement) that Australian Water Quality Guidelines (for various water environmental values) must be considered. This position is seen as a tool to promote and encourage environmental best practice.

The EPA actively promotes sustainable wastewater management by applying the waste management hierarchy consistently with the principles of ecologically sustainable development.

The EPA expects BATEA to be used wherever water is discharged to the environment to as far as is practicable reduce the potential for environmental harm.

## **Wastewater lagoon management**

Wastewater lagoon proposals are normally assessed by the EPA as part of development applications for WWTP. Conditions relating to the design, construction and commissioning of the lagoon can be imposed by the relevant planning authority following advice or direction from the EPA.

The EPA uses a risk-based approach when determining the construction and type of liner required for a particular lagoon proposal. In order to complete the assessment of a wastewater lagoon proposal, the EPA will need sufficient information to appropriately assess the risk. The information required by the EPA can be broadly categorised as:

- siting of the lagoon to assess risk based on proximity to watercourses and groundwater, roads and sensitive receptors
- nature of the wastewater to assess reactivity and potential for harm
- design of the lagoon and details of construction (depth, volume, subgrade, lining, leak detection and embankments) to assess containment risk.

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<sup>4</sup> Further information can be found in the EPA document, [Ambient air quality assessment](#) (2016).

In order to assist applicants the EPA has prepared guidelines on [Wastewater lagoon construction](#) (2014), including a [Risk Assessment Matrix](#) (Appendix 1) and a *Table of Suggested Construction and Lining Categories* (Appendix 2). To enable assessment of a proposed wastewater lagoon, proponents must obtain and provide the relevant information described in Appendices 1 and 2 of this guideline with their application.

### Use of recycled wastewater

The EPA advocates productive and sustainable use of recycled wastewater (ie treated wastewater that is to be used for another purpose) from a WWTP to reduce the state's reliance on traditional water supplies. The use of recycled wastewater avoids discharge to surface and ground waters and provides an environmental and economic benefit if undertaken sustainably.

Recycled wastewater use is a very significant component of the waste management hierarchy—it can supply water demand for many purposes often without the need for complex treatment performance.

It is the EPA's preference that recycled wastewater be applied to land as it can offer recreational, social and economic benefits; smaller volumes of recycled wastewater have greater use potential.

Recycled wastewater use is likely to be greatest in dry months (ie when traditional water supplies are diminished). During wet months, there is less water supply demand and there is the potential for stormwater ingress into the wastewater network. For these reasons, there should be adequate treated wastewater storage during wet months to accommodate both the normal wastewater inflows and the 25 year ARI<sup>5</sup> event that may contribute to WWTP volume.

Reuse options may include but are not limited to irrigation of recreational areas (golf courses, ovals, public gardens, greening of municipal areas), crops and pastures (vineyards), reuse within the processes of the WWTP, and dust suppression<sup>6,7</sup>. Third party agreements allow for reuse of all or part of the recycled wastewater.

### Discharge of treated wastewater

Disposal of treated wastewater to waters should not occur; prudent application of the waste management hierarchy should negate the need for any environmental discharge.

If, despite the application of the waste management hierarchy, a discharge is proposed, wastewater treatment should incorporate BATEA. Controlled discharge is licensed by the EPA and managed to minimise negative impacts to the receiving environment.

Treated wastewater discharge may enter surface or groundwater environments that are also influenced by other water quality pressures (such as nearby urban stormwater and other industrial discharges). These multiple inputs can create cumulative environmental impacts that need a co-ordinated, regional response (as directed by the EPA).

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<sup>5</sup> Average recurrence interval: a statistical estimate of the *average* number of years between the occurrences of a flood of a given size. For example, the 25 year ARI event will occur *on average* once every 25 years.

<sup>6</sup> The guideline [Wastewater irrigation management plan](#) (2009) assists in the development of a wastewater irrigation management plan and outlines the standards acceptable to the EPA, ensuring no detrimental impacts to ground water and soil.

<sup>7</sup> The *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1)* (2006) provides a framework for management of recycled water quality and use that applies to all combinations of recycled water and end uses, providing guidance on the long-term sustainability of any reuse scheme. It also provides specific guidance on the use of treated sewage and grey water for purposes other than drinking and environmental flows. The *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 2) – Managed Aquifer Recharge*, extends the guidance given in Phase 1 and focuses primarily on the protection of aquifers and the quality of the recovered water in managed aquifer recharge projects using all water sources including recycled waters.

Wastewater discharges should not be viewed in terms of their dilution ratio in the receiving environment. This perspective (ie dilution is the solution) tends to promote increasing discharge volumes if the receiving environment volume is large. The result can often lead to significant cumulative environmental harm where there are multiple discharges to the same environment.

## Environmental authorisations

A person undertaking a prescribed activity of environmental significance requires an environmental authorisation in the form of a licence under Part 6 of the Environment Protection Act 1993 (EP Act).

Schedule 1 of the EP Act lists activities of environmental significance. The list includes 'wastewater treatment facilities' that are designed to treat waste for more than 1,000 persons per day outside of water protection areas, more than 100 persons per day inside water protection areas, and works that involve the discharge of treated or untreated sewage to marine waters.

Schedule 22 of the *Development Regulations 2008* lists activities of major environmental significance that are generally referred to the EPA for direction. Schedule 22 is broadly reflective of Schedule 1 of the EP Act and includes wastewater treatment facilities as described in Schedule 1.

A development application for a wastewater treatment facility that is referred to the EPA for direction under Schedule 22 of the *Development Regulations 2008* will require a licence under the EP Act.

In accordance with Part 6 of the EP Act a licence cannot be refused for the wastewater treatment facility where a person has been granted a development authorisation under the *Development Act 1993* and the person has complied with conditions imposed by or at the direction of the EPA.

## Disclaimer

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

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## Further information

### Legislation

[Online legislation](#) is freely available. Copies of legislation are available for purchase from:

Service SA Government Legislation Outlet  
Adelaide Service SA Centre  
108 North Terrace  
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Telephone: 13 23 24  
Facsimile: (08) 8204 1909  
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### General information

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