Works approval for piggeries

EPA VICTORIA | Environment Protection Authority Victoria

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Guideline

Contents

VICTORIA State Government

Authorised and published by Environment Protection Authority Victoria
200 Victoria Street, Carlton VIC 3053
W epa.vic.gov.au | T 1300 372 842 (1300 EPA VIC)

Part A – Guideline to applying for a piggery approval or exemption

1. Introduction

1.1 When to use

Piggeries[1] with more than 5,000 pigs are scheduled as a B01 Animal Industry under the *Environment Protection (Scheduled Premises) Regulations 2017*. A new piggery or an expansion/modification of an existing piggery with more than 5,000 pigs needs to obtain either a works approval (WA) or a WA exemption from the Environment Protection Authority Victoria (EPA) before construction can commence. Applications for new developments or expansions with less than 5,000 pigs, are still required to comply with the environment protection framework, but do not require a WA.

This guideline does not address other approvals that may be required, such as planning permission from the relevant local council.

1.2 Purpose

This guideline has been developed primarily to assist piggery applicants to prepare WA or WA exemption applications, and to explain how EPA assesses these applications.

1.3 How to use this guideline

This guideline has two parts:

- Part A outlines the WA application and exemption process for proposed piggeries
- Part B explains the detailed information required in a WA or exemption application.

1.4 Legal status

The *Environment Protection Act 1970* (EP Act 1970), as well as several policies and regulations relevant to piggeries, are as listed in Table 1. Please note: This guideline is advisory only. It does not constitute legal advice. Applicants may wish to seek their own legal advice.

Table 1 – Victorian environmental regulations and policies relevant to piggeries

Acts and Regulations	Policies
Environment Protection Act 1970 (EP Act 1970)	State Environment Protection Policy (Groundwaters of Victoria) 1997 (SEPP GoV)
Environment Protection (Scheduled Premises) Regulations 2017	State Environment Protection Policy (Air Quality Management) 2001 (SEPP AQM)
Climate Change Act 2017	State Environment Protection Policy (Prevention and Management of Contamination of Land) 2002 (SEPP PMCL)
National Greenhouse and Energy Reporting Act 2007	State Environment Protection Policy (Waters of Victoria) 2003 (SEPP WoV)
	State Environment Protection Policy (Control of Noise from Commence, Industry and Trade) NO. N-1 (SEPP N-1)

1.5 Contact details

EPA recommends that applicants contact the EPA's Development Assessment Unit (DAU) at an early stage so that EPA is aware that an application is being prepared and can help with specific concerns. Contact details are:

- Email: approvals.applications@epa.vic.gov.au
- Phone: 1300 EPA VIC (1300 372 842).

[1] Agriculture Victoria uses the term 'Pig Farm' for land used to keep or breed pigs for the production of meat.

2. Works approval for piggeries

2.1 Approvals proposal pathway for commencing an application

An applicant should commence the application process by submitting an Approvals Proposal Pathway form. Based on an Approvals Proposal Pathway submission, the EPA shall assess a proposed piggery as either exempt from or requiring a WA.

Figure 1 presents a flowchart of preparing an approval pathway form and EPA's decision pathway. EPA's *Approvals Proposal Form and Pathway Guideline* (publication 1560) details the complete approvals proposal pathway process.

2.2 General requirements for applications

For a proposed piggery to be considered for a WA or WA exemption, it must:

- Be permitted by the land use planning scheme
- Not adversely affect the interests of others
- Demonstrate compliance with the EP Act 1970, relevant state environment protection policies, regulations and guidelines (as listed in Table 1 and detailed in relevant sections of Part B of this guideline).

The quality, clarity and thoroughness of the information provided to EPA is critical and will impact EPA's assessment of a proposal. Appendix 1 provides a list of information required for preparing a WA exemption or WA application.

2.3 Criteria for a works approval exemption

Under S19A(4) of the EP Act 1970, applicants can apply for WA exemptions. In granting such exemptions, EPA must establish that the proposal will not adversely affect the quality of any segment of the environment or the interests of other persons. The following are positive indicators for an exemption decision:

- Existing piggery with a strong track record of good environmental performance
- A valid planning permit has been granted for the proposal
- The proponent has undertaken an appropriate level of engagement with neighbours and stakeholders (see Part B - 5)
- The design and management of the piggery adopts best practice[2] in addressing key environmental and public health risks as identified using a risk-based assessment
- The development complies with relevant regulatory requirements listed in Table 1
- A suitable Environmental Management Plan (EMP) has been provided meeting the requirements in Appendix 3.

To be considered for a WA exemption, the Pathways form and supporting documentation should be as comprehensive as possible (refer to Figure 1 and Appendix 2).

2.4 Works approval applications

If a WA exemption cannot be considered, a WA application must be submitted, as detailed in EPA's *Works approval guideline* (publication 1658)[3] .

Figure 2 shows the steps required to prepare a WA application for a piggery. It is important to note that while much of the documentation may have already been developed during the Approvals Proposal Pathway process, it should also be included in the WA application to ensure it is comprehensive and complete.

There are two types of assessment processes for a WA:

- Standard: for applications with medium to high potential impact to the environment and/or significant third-party interest. The statutory date for a WA decision is four months after an acceptable application to EPA has been received for assessment. EPA endeavours to process these within three months.
- Fast-track: for proposals that have a low potential impact on the environment and the community, and use standard proven technology. The due date for a fast-track WA decision is six weeks after an acceptable application to EPA has been received for assessment.

Figures 1 and 2 of EPA's works approval assessment process - *EPA's works approval assessment process* (publication 1657) provide a complete cycle of works approval processes and timelines.

[2] Refer to 2.6 of Part B for an explanation of best practice.

[3] This guideline has been structured to match with the works approval guideline to make it easier for applicants to navigate the process.

2.5 Risk-based approach

When considering applications for determining the levels of environmental design and management practices to be adopted, EPA uses a risk-based approach to evaluate the potential impacts a development could have on the environment and public health. A structured risk assessment provides a transparent tool for identifying, characterising and grading risks so that design and management actions can be implemented to ensure the environment and public health are protected.

Sections 7 and 14 of Part B of this guideline provide guidance on risk identification and management, and specifies EPA's requirements to protect each segment of the environment to achieve regulatory compliance. Appendix 2 and Figure1 of this guideline provide a list of points to consider for the risk assessment.

The National Environmental Guidelines for Piggeries (NEGP), published by Australian Pork Limited (APL), contain a risk assessment procedure in Appendix B. The National Environmental Guidelines for Rotational Outdoor Piggeries (NEGROP) contains a risk assessment procedure for this type of outdoor piggery applicant.

2.6 Protection of beneficial uses and public health

Consideration of how the proposed waste management activities could affect the environment and public health is a key aspect for a piggery WA application and EMP. The EP Act 1970 and all SEPPs stipulate both protection of human health and the environment as inseparable considerations in EPA's decision-making. At piggeries, the management of effluent, manure, spent bedding and mortalities are activities that can impact environment protection and therefore public health.

Biosecurity is not an area regulated by EPA. Piggeries should follow Agriculture Victoria's Biosecurity Guidelines for Pig Producers (www.agriculture.vic.gov.au). These guidelines recommend a buffer of 3 km between piggery sites to limit biosecurity risks.

Figure 1 – Preparation of an Approvals Proposal Pathway form and EPA decision pathway for piggeries

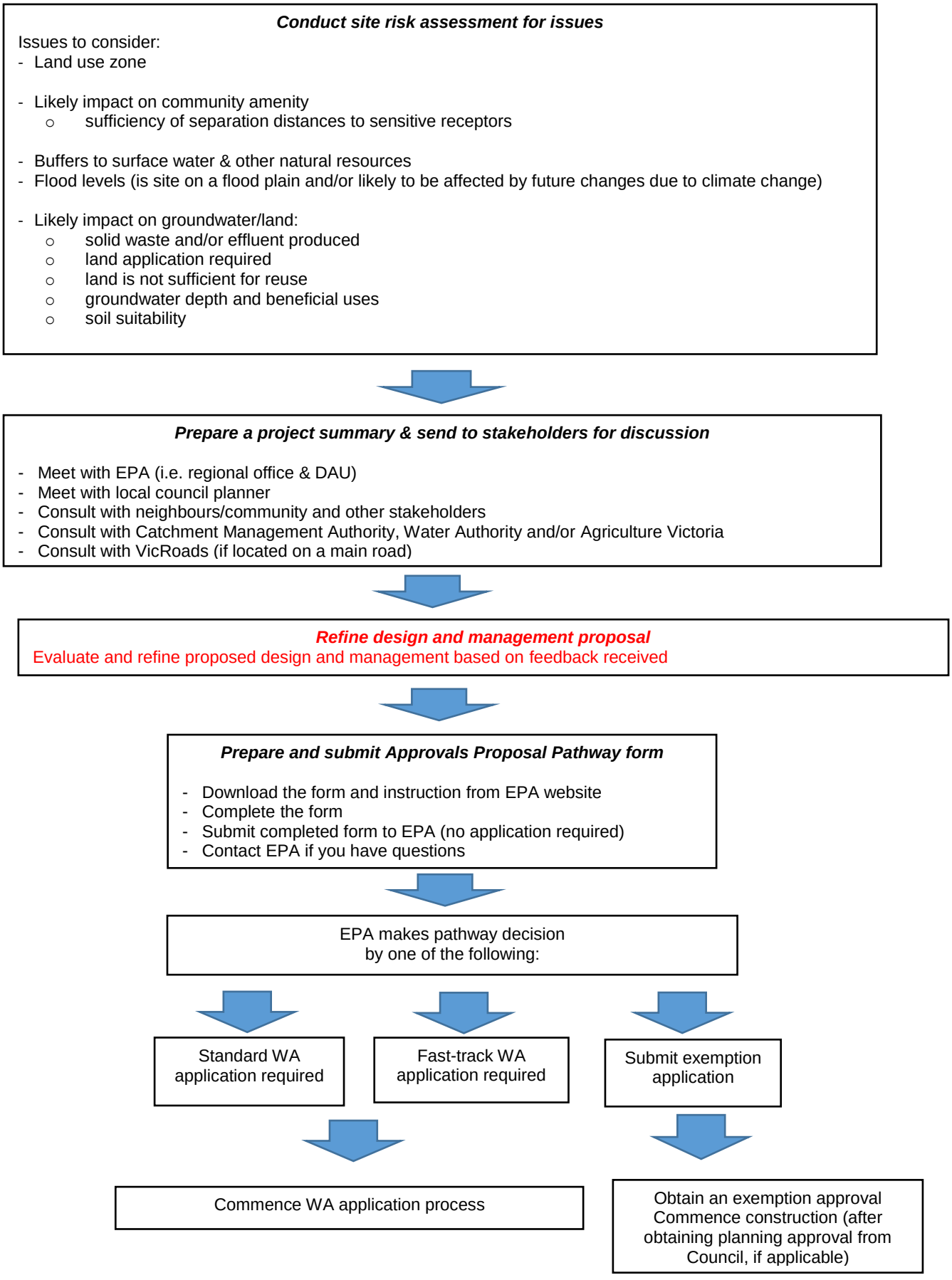
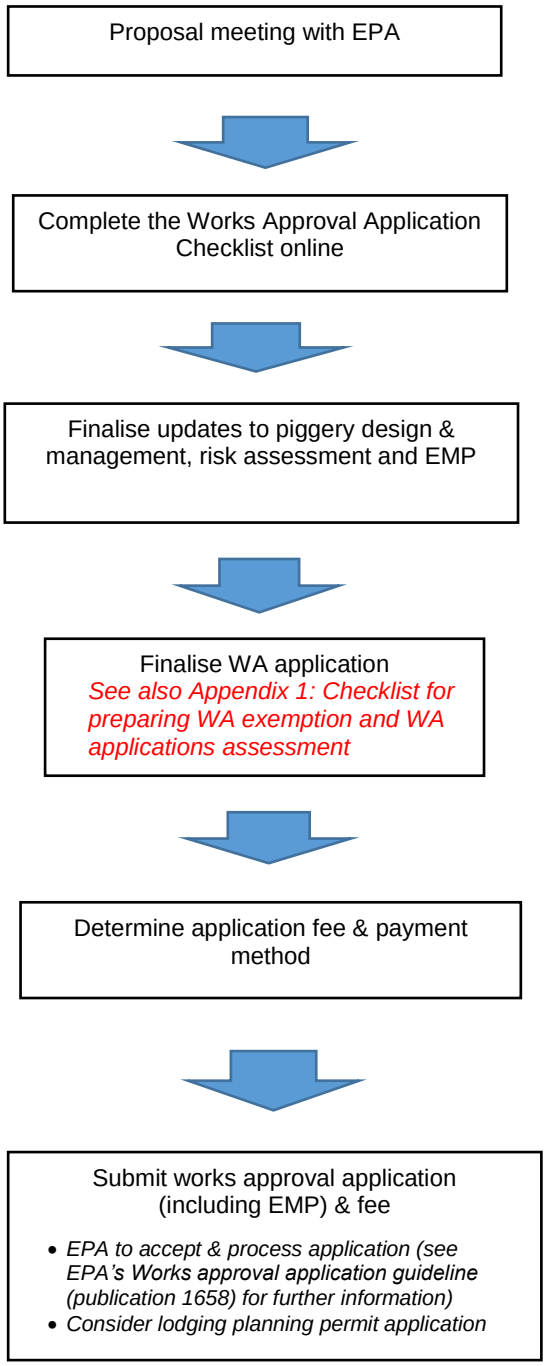


Figure 2 – Preparation of a Works Approval Application for piggeries



Part B – Information requirement

SECTION 1 – General information

This is a descriptive version of EPA's *works approval application guideline* (publication 1658), tailored to the design and management of piggeries. It should be used alongside EPA's *Works approval application guideline* (publication 1658) which specifically sets out every item that is to be included in a WA application.

In addition to the guidance documents mentioned here, there is also an online WA application checklist generator which will produce a table of contents for an application, including key documentation that should be included. This can be found by searching for 'works approval application checklist' on the EPA website.

1 Primary information

A WA must only be granted to a legal entity (legal person) who is the occupier of the premises. An application fee must be paid with the WA application. Fee structure is detailed in Section 1 of EPA's *Works approval application guideline* (publication 1658).

2 Land use

The site of a proposed piggery is critical to a WA application. Local councils can advise on planning information, including the land use zone, if a piggery is permitted in that zone, nearby sensitive zones and planning overlays.

S19B(7A) of the EP Act 1970 states that if a planning scheme requires a permit and it has not been issued, then a WA must be issued with a condition that the approval does not take effect until a copy of the permit is served on EPA.

Details of the following information should be provided:

Element	Description
Land use information	- proposed piggery's location - past and proposed land uses - land use zones
Surrounding land uses	- beneficial uses of the surrounding lands, groundwater - locations of and distances to neighbouring sensitive areas/ residents
Planning permit	- the status of a planning permit: o not required with reasons or o required with a copy attached or yet to be obtained (i.e. application submitted or yet to be submitted)

3 Site specific information

Applicants must describe the site-specific information, including those listed below:

Element	Description
Climate data	- median annual rainfall - average monthly rainfall - rainfall intensity data (including 1 in 20 year event) - average monthly evaporation - monthly maximum and minimum temperatures - seasonal wind speed and direction - the altered environmental conditions[4] (i.e. temperature, rainfall, extreme weather events, floodplain levels and/or river flows)
Soils and topography	- description of soils and topography that will be used to keep pigs and for reuse areas. Include soil chemistry plus details of any structural or erosion issues

[4] This information is required for a proposed project which is to operate beyond 2030. This information can be found in the relevant regional climate change projections available on DELWP's Climate Ready Victoria pages

Groundwater and geology	- details of any bores on the property (or any proposed) - depth to groundwater and geology - groundwater quality and proposed uses (if any) - beneficial uses (as specified in SEPP (Groundwater of Victoria) - details of any groundwater licences
Surface water	- description of watercourses or other surface waters on or near the property - locations of waterways and distances - details of any surface water licences held

4 Track record

If an applicant has an existing piggery, they are required to provide a summary of its environmental performance over the last three years. This includes information pertaining to any community concerns, enforcement actions from EPA, remedial actions taken and how these issues will be addressed at the proposed piggery. Refer to Section 1 Part 3 of EPA's *Works approval application guideline* (publication 1658) for further details.

5 Community engagement

There can be much public interest in new or expanding piggeries, both positive and negative. EPA considers that it is good practice for applicants to conduct community and stakeholder engagement early in the WA process to identify their potential concerns and avoid any delay in obtaining an approval. Specialist consultants, local councils and EPA can help applicants complete their community and stakeholder engagement responsibilities. Section 3 of EPA Publication 1560 contains information to help applicants complete their stakeholder engagement obligations. EPA will consider community concerns relating to environmental and public health protection in its assessment.

6 Process and integrated environmental assessment

6.1 Description of the proposal

Applicants must describe all facets of a proposed piggery, including:

Aspect	Description
Existing and proposed piggery operation	- capacity - pig production system /housing types - feed usage and feeding systems - proposed operating lifespan
Land area	- land areas available for piggery production (including outdoor free range or rotational units) - land areas available for land application of wastes, mortalities and effluent
Water supply and consumption	- drinking, cooling and/or cleaning
Waste and mortality management	- management methods for manure, spent bedding, mortalities and/or effluent, including (where appropriate) their storage, treatment and disposal
Others	- power consumption and major equipment - truck movements to and from the site

Applicants should ensure that diagrams, plans and maps are provided as part of these descriptions as this will help explain the proposed operation.

6.2 Environmental best practice

It is a statutory requirement that new and expanding facilities employ processes that represent environmental best practice. *Demonstrating best practice* (EPA Publication 1517) specifically discusses what environmental best practice means and provides guidance on what a WA application should include. The best practice[5] should be:

[5] *Demonstrating best practice* (EPA Publication 1517).

- proportional to the significance of the environmental problem being addressed
- preventative
- undertake all practicable measures to protect the environment.

To demonstrate environmental best practice at a proposed piggery, applicants should describe how environmental best practice processes and technologies have been selected. There should be clear links between the selected environmental best practice and the management or minimisation of risk.

Best practice design and management can include the consideration of (where appropriate):

Aspect	Best practice to minimise / manage risks
Control pollution emissions	- minimising energy use and greenhouse gas emissions - minimising odour and noise emissions
Protect surface water Prevent land and groundwater contamination	- collecting/managing contaminated run-off and/or leachate - installing a solid waste storage and treatment facility of sufficient size (compost pad) with bunding and a low permeability base - installing a fit-for-purpose wastewater treatment system to produce suitable effluent for land application with consideration of local situation (land availability, groundwater table, flood level, crops etc.) - defining appropriate nutrient loading to land in reuse areas for: o treated effluent o (stockpiled/composted) bedding materials and composted mortalities o rotational outdoor piggeries

As an example of some best practice guides available that are specific to piggeries, APL has developed a series of industry 'best practice guidelines' including:

- National Environmental Guidelines for Piggeries (NEGP)
- National Environmental Guidelines for Rotational Outdoor Piggeries (NEGROP)
- Piggery Manure and Effluent Management Reuse Guidelines
- New Design Guidelines for Anaerobic Ponds.

Other guidance from APL is available on their website (www.australianpork.com.au).

Early discussions regarding best practice selection between the applicant and EPA are recommended.

6.3 Integrated environmental assessment

When designing a piggery, there may be conflicting environmental goals. For example, piggery shed air quality and odour suppression may be improved by more regular cleaning. However, this will consume more water and therefore create more effluent.

Competing considerations should be identified, and measures for how they will be balanced to achieve the best overall environmental outcome described.

SECTION 2 – Environmental information

This section of a WA application provides information to demonstrate protection of each segment of the environment. Although some of the environment segments are more relevant to piggeries than others, each one must be addressed as detailed in EPA's *Works approval application guideline* (publication 1658).

7 Climate Change

7.1 Overview

Climate change (CC) is a major, global environmental issue. In Victoria, this potentially means a warmer and drier future, with an increasing likelihood of more extreme events such as heatwaves, bushfires, storms and wet-weather events. EPA expects that applicants' proposals adapt to ensure the piggery can operate as planned in the future.

7.2 Summary of legislative requirements

Section 17 of the Climate Change Act 2017 requires EPA, when it makes a WA decision, to have regard to the potential impacts of CC relevant to the decision and the potential contribution of the decision to GHG emissions (refer to 8).

Relevant considerations are specifically identified in section 17(3) of the Climate Change Act. These are explained further in the Works Approval – consideration of climate change pages which also includes links to Victorian government published CC projections.

7.3 Risk identification and management

7.3.1 Potential impacts of climate change on the proposal

Applicants should provide consideration for:

- climate change resilience which is to assess whether a proposed piggery can operate as planned with altered environmental conditions under projected climate change
- climate change adaptation measures which identify whether measures and/or future contingency should be adopted to allow a proposal to operate as planned with altered environmental conditions under projected climate change. An example is the need to upgrade wastewater storage ponds to cater for more intense rainfall. If measures are considered necessary, these should be clearly identified in a Climate Change Adaptation Management Plan (CCAMP). This should include a schedule of the proposed measures, details of the regular monitoring and review of key parameters that will trigger the implementation of the adaptation measure(s). CCAMP should be included in an EMP.

7.3.2 Potential impacts of a proposal under future climate scenarios

Applicants should assess potential environmental impacts arising from a proposed piggery under future climate scenarios. For example, the likely frequency of adverse dust or odour impacts in the future with projected drier and warmer environmental conditions.

8 Energy use and greenhouse gas (GHG) emissions

8.1 Overview

Estimates of GHG emissions produced by a proposed piggery should be provided. Calculations should include GHG emissions from energy-related sources (such as electricity use) and non-energy related sources (such as methane from anaerobic ponds).

8.2 Summary of legislative requirements

The legislative requirements for energy use and GHG gas emissions are:

- SEPP AQM, Clauses 18 and 19
- *Protocol for Environmental Management: Greenhouse gas emissions and energy efficiency in industry* (2002) (EPA Publication 824)
- *Climate Change Act 2017*, Section 17.

Key considerations for piggeries from these documents are:

- annual quantity of energy used and energy-related GHG emissions

- best practice energy management
- annual quantity of non-energy-related GHG emissions
- best practice GHG emissions management
- contribution of the proposal to Victoria's GHG emissions (refer to the Australian Greenhouse Emissions Information System to obtain the latest greenhouse gas emissions data).

8.3 Risk identification and management

PigGas, developed by APL, is a GHG calculation tool for estimating the total carbon dioxide equivalent emissions from a piggery. It also contains calculations for methane production from uncovered ponds. The PigGas calculator and users guide can be found on the APL website (www.australianpork.com.au).

Energy-related emissions: Common power-consuming equipment at piggeries can include pumps, ventilation equipment and heating units. GHG calculators allow applicants to identify key energy-consuming equipment and implement management and maintenance practices to reduce total GHG emissions.

Non-energy related emissions: biogas may be beneficially used to generate heat and/or electricity. Management of biogas can reduce total GHG emissions, reduce reliance on energy and generate carbon credits. Specialist advice should be sought to determine the biogas system that may be suitable for a proposed piggery.

9 Water resource use

9.1 Overview

This section provides information on the management of fresh water as a piggery input. Piggeries consume water primarily for stock drinking, cleaning and sometimes cooling. Water is typically sourced from an irrigation scheme or high-quality groundwater bores, or stored rainwater. Large volumes of water may also be required to sustainably reuse effluent, that is, by diluting (shandying) highly saline effluent before reuse.

It should be noted that climate change projections are for Victoria to become generally drier, which will affect future water availability. Information on future surface water availability under a changed climate was published by the Victorian Climate Initiative (a Victorian Government launched research initiative with research partners CSIRO and Bureau of Meteorology) in 2016 and includes hydroclimate predictions for 2040 and 2065.

9.2 Summary of legislative requirements

SEPP WoV, Clause 40 states that businesses shall:

- conserve the use of potable water
- ensure a sustainable water supply for all beneficial uses
- implement water saving practices and measures
- ensure that reuse and recycling of wastewater is maximised.

9.3 Risk identification and management

PigBal 4 can be used to estimate total water use at a proposed piggery and identify major water consumption areas.

Environmental best practice measures to minimise water consumption should be applied. These include:

- selecting appropriate drinking water equipment
- using water efficient cleaning practices
- regularly maintaining water supply infrastructure
- designing sheds to reduce cooling requirements
- regularly monitoring water use to identify areas of waste or leaks.

10 Air emissions

10.1 Overview

Odour nuisance depends on the frequency, intensity, duration and offensiveness of odour that a receptor experiences. Significant odour sources

at piggeries can include:

- pig sheds of conventional indoor piggeries

- effluent treatment system
- handling and storage of manure and spent bedding materials
- land applications (reuse) of treated effluent, sludge, manure, and spent bedding materials.

10.2 Summary of legislative requirements

SEPP AQM states that:

- generators of emissions must apply environmental best practice to the management of their emissions (Clause 18 (3) c)
- for industries involving intensive animal husbandry, an integrated set of criteria may be applied to ensure beneficial uses are protected including a design criteria of 5 odour unit for 3-minute averaging time at and beyond the boundary (Schedule A. 9).

This set of criteria should include:

- a location in an area with a low density of sensitive land use receptors. That is, premises must be located in a rural zone
- a location that is consistent with integrated land use planning considerations
- works designed in accordance with a set of industry performance standards
- operations conducted in accordance with an EMP.

10.3 Risk identification and management

Piggeries by their nature are inherently odourous. The risk of causing odour nuisance can be minimised in two ways:

1. Siting the piggery away from sensitive receptors; that is, providing an appropriate separation distance to avoid adverse environmental and public health risks.
2. Utilising odour mitigation methods in both piggery facility design and operational management.

Applicants can determine the required separation distances using the Level 1 approach in Appendix A of NEGP[6]. EPA considers that appropriate design and management for minimising odour must be implemented. APL's Minimising Odour from Piggeries booklet is a useful reference.

11 Noise emissions

11.1 Overview

Sources of noise from piggeries include truck movements and normal farming activities involving tractors, livestock and irrigation equipment.

11.2 Summary of legislative requirements

Piggeries are often located in zoned farming land of regional areas which are not covered by the State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No N-1 (SEPP N-1) as this policy only applies to premises located in Melbourne's metropolitan region. The noise levels acceptable from farming activities (such as intensive livestock operations) are managed using EPA's *Noise from industry in regional Victoria* (publication 1411). Applicants should demonstrate their proposals comply with this guideline.

11.3 Risk identification and management

If noise emissions from a proposed piggery could present a risk to local amenity or have been raised as a concern during the community engagement process, specialist consultants can be engaged to conduct a noise assessment.

12 Stormwater and wastewater management to protect surface water

12.1 Overview

Piggery operations often generate uncontaminated stormwater run-off, contaminated stormwater run-off/leachate and wastewater (effluent). These are normally generated from:

- uncontaminated stormwater run-off from roof area of shed (refer to 12.3.1)

[6] *Recommended Separation Distances for Industrial Residual Air Emissions – Guideline* (EPA Publication 1518) provides general advice on recommended separation distances between industrial land uses that emit odour or dust, and sensitive land uses, but does not cover piggeries.

- contaminated stormwater run-off: (refer to 12.3.2)
    - run-off from animal delivery and handling areas and waste reuse areas
    - leachate from solid waste storage and handling areas, as well as mortality composting areas
    - paddocks of rotational outdoor piggeries
- wastewater (effluent) from conventional piggery sheds (refer to 12.3.3).

This section provides the design and management requirements for these streams to protect surface water. It is highlighted that whilst under climate change Victoria will generally become drier and will become prone to more frequent and severe wet weather events.

12.2 Summary of legislative requirements

SEPP WoV states that:

- Reuse and recycling of wastewater is sustainable and does not pose an environmental risk to the beneficial uses of surface waters and ground waters (Clause 31)
- Animal wastes must not be dumped into surface water and the run-off of animal wastes to surface water needs to be minimised (Clause 39)
- Agricultural practices need to be implemented to minimise the run-off of pollutants such as sediment, nutrient, salt, biocides, pathogens and litter to surface waters (Clause 50)
- Wastes and wastewater from intensive agricultural industries must not be discharged to surface waters (Clause 52).

12.3 Risk identification and management

12.3.1 Uncontaminated stormwater

Conventional pig farm sheds should be designed to keep clean stormwater separate from effluent. Ensuring stormwater remains free of contamination reduces the effluent treatment system capacity that would otherwise be required. It also provides a valuable water resource, as stormwater run-off from the roofs of deep litter sheds should be captured and stored for use on-site (i.e. shed cleaning and/or fire protection).

12.3.2 Contaminated run-off and leachate management

Run-off from animal delivery and handling areas should be collected and managed to prevent it entering surface water.

Manure and bedding material storage areas, composting areas and/or mortalities' composting pads should be bunded or be constructed with interception drains around the perimeter of these facilities to capture and control leachate.

The collected contaminated stormwater run-off and/or leachate should be stored in appropriately lined ponds and be used for composting or pumped to the wastewater treatment system. Other uses can be considered depending on the site-specific situation.

Rotational outdoor piggeries and other types of free range piggeries need to ensure that stormwater run-off from the pig areas cannot flow into surface waters and that best practice is adopted to avoid diffuse pollution to groundwater. For guidance on rotational outdoor piggeries, the NEGROP provides detailed design and management practices.

12.3.3 Wastewater management

12.3.3.1 Treatment system selection

Wastewater treatment systems are required to treat piggery effluent largely generated from conventional sheds. Common waste treatment technologies include solid separation equipment, anaerobic and aerobic/facultative treatment ponds, treated effluent disinfection, sludge drying beds and solid waste composting areas.

The technologies selected for a proposed piggery will depend on:

- the type of facility planned, considering housing type, shed design and cleaning methods.
- quality and quantity of effluent generated (water, total solids, volatile solids, nitrogen, phosphorus and potassium)
- site specific conditions, including:
    - land availability for reuse, including third party reuse
    - soil characteristics
    - groundwater levels and beneficial uses
    - crop types and nutrient uptake capacity
- quality of treated effluent required for reuse.

APL have developed design tools to assist with this, including:

- PigBal 4 which is a model for estimating waste outputs for the evaluation
- NEGP
- APL Piggery Manure and Effluent Management and Reuse Guidelines
- APL New Design Guidelines for Anaerobic Ponds.

12.3.3.2 General design considerations and specific requirements

Applicants must ensure and demonstrate that:

- A wastewater treatment system is designed to produce treated effluent suitable for storage and reuse on the premises or by third parties (also refer to 14.3 and 15)
- No untreated, treated or diluted effluent shall enter surface waters
- Sufficient buffers are provided to protect surface waters from being contaminated with piggery effluent and manure, particularly in areas used for irrigation of treated piggery effluent. Recommended buffer distances are provided in NEGP
- Reuse areas are not located on the flood plain, or appropriate measures are in place to control run-off.

Applicants should ensure that:

- Storage ponds are designed and constructed with have sufficient capacity to accommodate run-off from the total process area resulting from a one-in-20-year storm event
- Effluent treatment pond linings and storage pond linings are provided with clay liners or equivalent. EPA's standard requirement for liners is a permeability of less than $1x10^{-9}$ m/s with suggested liner thicknesses as below:

Scenario	Storage capacity	Depth	Fill types	Clay liner thickness
1	<3ML	<1.5 m	Intermittently filled	Surface compacted clay soils
2	≥3 ML	<1.5 m	Permanently filled	300 mm thick liner
3	≥3 ML	~3 m	Permanently filled	600 mm thick liner
4	≥3 ML	>5 m	Permanently filled	1000 mm thick liner

Applicants should document how the potential for seepage from storage ponds and ponds will be managed to ensure that risks to groundwater have been appropriately addressed.

13 Prevention of land and groundwater contamination

13.1 Overview

Applicants must demonstrate the site proposed is suitable for piggeries, taking into account considerations such as topography, flooding, climate and soil quality. Piggeries should not be in areas that will be affected by a 1-in-100-year flood.

The impact on land and groundwater of piggery activities will depend on:

- the nature of the site's soil and groundwater (13.3.1 and 13.3.3)
- application of solid wastes to land, including spent bedding manure and composted mortalities (13.3.2)
- the design of liquid and solid waste management facilities (14.3.1)

13.2 Summary of legislative requirements

SEPP GoV states that:

- All practicable measures must be undertaken to prevent pollution of groundwater (Clause 12)
- There must not be any direct discharge of waste to any aquifer (Clause 20)
- Water table rise needs to be considered when waste is deposited, discharged or disposed to land (Clause 21)
- Best practice should be used to avoid diffuse pollution to groundwater (Clause 24).

SEPP (Prevention and Management of Contamination of Land) 2002 states that:

- The quality of the land environment will be maintained, and where necessary enhanced, to maximise to the extent practicable of the beneficial uses of the land environment (Clause 8)
- The application of wastes to land, including land used for agriculture, may be undertaken when managing land for a beneficial use (Clause 16)

- Disposal or reuse of any material off-site is undertaken in accordance with any legislative requirements (Clause 18).

13.3 Risk identification and management

13.3.1 Soil Suitability Risks

Soil testing (for both soil type and soil chemistry) will be required as part of a whole site assessment to determine land suitability for the type of piggery, engineered structural requirements (e.g. ponds) and for waste reuse on site. It is recommended that specialist advice is sought to assist with this work.

NEGP and NEGROP provide a list of issues that can be used as a guide during the planning and design of a new piggery or piggery expansion.

13.3.2 Land application risks

13.3.2.1 Management of waste application rates

The application of piggery effluent (treated), manure, stockpiled /composted spent bedding or composted mortalities to land (reuses) has the potential to improve soil fertility when used appropriately. However, excess nutrients and salts present in these materials can also have a negative impact on the beneficial uses of the land.

Testing of soil type and chemistry should be undertaken at all development sites to determine suitable application rates for the reuse of piggery effluent, manure or compost. Specialist soil testing, irrigation, land management and agronomic advice is recommended when developing a management plan for the beneficial reuses of those wastes.

Details of the soil type and chemistry are needed to determine application rates, and therefore soil testing should be undertaken at all development sites. Specialist soil testing, irrigation, land management and agronomic advice is recommended when developing a management plan.

Conventional and deep litter piggery

Applications should include the following information:

- Prediction of the amount of effluent, manure, bedding/composting materials that will be produced
- Mass balance estimate of nutrient contents in all wastes being reused
- Reuse proposal, consisting of:
  - sizing of reuse areas, with explanation of:
    - crop, pasture or other plants being used, the plant demand (uptake) for water and nutrients, and their ability to tolerate salts
    - locations and areas for waste application (on-farm and/or third parties)
  - application practices: frequency, rates and spreading/irrigation activities.
- For effluent with high salinity and nutrient content, dilution (shandying) with irrigation water or stormwater may be required before it is suitable for irrigation. Dilution rates should be provided.
- Treatment pond desludging shall be required periodically. This sludge may have very different characteristics to piggery effluent and manure. In particular, it can be a rich source of phosphorus. The nutrient composition of pond sludge plus other key agronomic parameters (e.g. EC, pH) should be determined.

Management practices, including the following, should be considered:

- Stockpiled or composted solid waste is often applied at or before planting out crops. These wastes should not be applied when rain is forecast or during the rain event. It is advised that waste be incorporated into the soil soon after spreading to reduce the risk of nutrient leaching.
- Withholding periods for crops and waste application to land should be considered.
- Land that is below a 1 in 5-year flood line is not appropriate as a reuse area. Local councils and catchment management authorities can advise on flood lines.

Rotational outdoor piggeries

Applicant needs to provide paddock management measures, including:

- measures proposed to retain groundcover
- other measures to be used to prevent erosion from pig paddocks (e.g. contour banks)
- planned paddock rotations to prevent land and groundwater contamination. Considerations include:
  - estimated rate of macro-nutrients (NPK) added to the soil by the planned pig phase
  - estimated rate of macro-nutrients (NPK) removed from the soil by the planned crop/forage/pasture phase
- physical and chemical properties of the soil at the site (e.g. appropriateness of the soil for a rotational system and waste management).

Mortalities

Composting or rendering of mortalities is industry best practice. Dumping or burning are not acceptable carcass management practices, but may be required in emergency situation. Further information on mortality management can be sought from and NEGP.

If mortalities are composted for land application, the management practices for their application rate should consider the following:

- prediction of compost production
- mass balance estimate of nutrient contents
- application rate and area.

13.3.2.2 Prevention of environmental and health risks

As piggery effluent and solid waste contain pathogens, any effluent, manure or compost (liquid or solid) applied to land for growing crops shall be treated to ensure it is fit for its intended use. Only pasteurised composted solid waste that has achieved a pathogen reduction can be applied to land belonging to third parties. Applicants must address these issues in the applications where appropriate.

Management practices, including the following, should be followed:

- If there is a third-party reuse of solid wastes, they should be stored on-site for at least 10 days to meet the pathogen reduction requirement for managing health risks.
- Stock shall be withheld for at least 21 days from areas that have had piggery effluent and manure applied.
- No untreated effluent will be applied to land
- Keep detailed records of mortality compost applications
- Piggery effluent and manure generally shall not be used for growing crops for human consumption, where waste (effluent, manure or treated waste) comes into contact with the edible part of the plant. If such use is proposed, it should be included in the application for EPA's consideration.

13.3.3 Groundwater risk

There may be risk to the beneficial uses of groundwater from the application of effluent or solid waste to land. The first step is to identify the relevant beneficial uses of groundwater using SEPP GoV (see Tables 1 and 2 in the SEPP). The segment (based on salinity of the local groundwater environment) and beneficial uses highlight what needs to be protected and thus considered in risk management of a piggery. Further to this, the depth and confinement of groundwater resources must be assessed to ensure the land is suitable for piggery structures and reuse of pig effluent and / or solid waste. If the site has shallow or poorly contained groundwater and beneficial uses of groundwater are at risk, a higher standard of design and management shall be needed to ensure groundwater is protected.

14 Waste

14.1 Overview

Solid forms of piggery waste (e.g. manure, spent bedding or waste feed and mortalities) are considered industrial waste. Applicants should therefore apply the principles of the waste hierarchy (as specified in 14.2) to manage these wastes.

Provided that effluent or waste water is managed in accordance with specifications acceptable to EPA (see section 11), it is also considered industrial waste. If it is not managed in accordance with EPA requirements, then waste water and effluent is considered prescribed industrial waste.

The following section explains the design, storage and treatment requirements for solid wastes as their management aspects are discussed in 13.3.

14.2 Summary of legislative requirements

The *Environment Protection Act 1970* states that:

- Wastes should be managed in accordance with the following order of preference – avoidance, reuse, recycling, recovery of energy, treatment, containment, disposal (Section 12).

SEPP PMCL states that:

- To prevent contamination of land, any occupier or other person within the policy area involved in the transport, storage or handling of any waste must apply best practice (Clause 17).

14.3 Risk identification and management

14.3.1 Manure and spent bedding storage and treatment

After applying waste minimisation across all proposed piggery operations, environmental risks from the generation of wastes can be managed by selecting best practice technologies and management practices for treatment and reuse.

Composting solid manure and spent bedding is an effective treatment method to reduce the pathogen risk associated with the reuse of these materials. Otherwise, temporary stockpiling of these wastes may be necessary prior to their reuse (13.3.2.2). Appropriate engineer-designed and constructed pads and a storage structure (pond or tank) will be required which should include the following features:

Aspect	Requirements
Storage/composting pads	- Sizing of pad areas with information about the type, quantity, frequency of addition and removal of material from the pad - Be sealed using suitable, stable, low-permeability construction material. The pad should have a hydraulic conductivity of less than 1 x 10^{-9} m/s - Be graded between 2 to 4 percent to carry surface run-off to collection drains and/or storage pond or tank which have sufficient capacity to capture leachate resulting from a one-in-20-year storm event - Be bunded
Storage pond or tank	- Be of sufficient capacity to capture leachate resulting from a one-in-20-year storm event - Be lined to achieve a hydraulic conductivity of less than 1 x 10^{-9} m/s

In addition, the NEGP and Piggery Manure and Effluent Management Reuse Guideline provides detailed guidance on composting solid (organic) wastes and aging manure.

15 Third party reuse and product disclosure statement

15.1 Summary of legislative requirements

The EP Act 1970 states that '*Producers and users of goods and services have a shared responsibility with Government to manage the environmental impacts throughout the life cycle of the goods and services, including the ultimate disposal of any wastes'* (1H principle of product stewardship).

15.2 Risk identification and management

If third party reuse of any waste generated by the proposed piggery is to occur, the applicant is expected to address the potential for any environmental and public health risks associated with the supply of said reuse material. The applicant should include details of proposed third party reuse in their EMP (see section 16), which should include the following:

- Identify, assess and manage environmental and health risks associated with the supply of effluent and solid waste (e.g. pathogens, biosecurity, etc.)
- Provide evidence of having an agreement in place with each third party
- Discuss management practices with third parties
- Provide third parties with a Duty of Care statement, which includes application rates, separation distances and buffers, suitable crops for agricultural reuse of piggery effluent/manure/composts, withholding periods before grazing or harvest, handling practices and precautions, as well as monitoring requirements
- Provide third parties with a product disclosure (knowledge) statement
- Keep records of analysis results of material supplied for reuse and quantity of materials for both parties.

16 Environmental management

16.1 Environmental management plan (EMP)

Under the *Environment Protection (Scheduled Premises) Regulations 2017*[7], the ongoing operation of a piggery with more than 5,000 pigs scheduled as B01 Animal Industry is exempted from licensing. However, the EPA must ensure

[7] Reviewed by Department of Environment, Land, Water and Planning (DELWP) and EPA.

appropriate processes are in place to manage the ongoing operation of the site, to meet environmental obligations and to guide day-to-day environmental management of a proposed piggery. Thus, applicants are required to include an EMP in their application.

If a WA application is for the expansion of an existing piggery which has an EMP, the existing EMP should be updated.

A detailed list of the structure and contents of a piggery EMP is provided in Appendix 3.

16.2 Non-routine operations and contingency planning

It is important that applicants consider non-routine situations that could occur (now and in the future regarding projected altered environmental conditions under climate change) and what contingency plans would be needed to ensure environmental and public health impacts are minimised. These details should also be included in an EMP.

Examples of non-routine events are:

- power or equipment failure
- disease outbreak/biosecurity threat
- mass mortalities event
- fire
- wastewater treatment system failure, i.e.:
  - anaerobic pond failure
  - effluent pond spills or contaminated run off into waterways
- reuse related issues, i.e.
  - crop failure on reuse area
  - prolonged wet weather or flooding, which prevents irrigation of effluent
  - third party ceases reuse
- difficulty sourcing bedding material
- water supply issues.

Acronyms

APL	Australian Pork Limited
CCAMP	Climate Change Adaptation Management Plan
DAU	Development Assessment Unit of EPA Victoria
EMP	environmental management plan
EP Act 1970	*Environment Protection Act 1970*
GHG	greenhouse gas
m/s	meter/second
NEGP	National Environmental Guidelines for Piggeries, Australian Pork Limited, 2010, or newer editions
NEGROP	National Environmental Guidelines for Rotational Outdoor Piggeries, Australian Pork Limited, 2013, or newer editions
SEPP AQM	state environmental protection policy (air quality management)
SEPP GoV	state environmental protection policy (groundwater of Victoria)
SEPP N-1	state environmental protection policy (control of noise from commerce, industry and trade) No N-1
SEPP PMCL	state environmental protection policy (prevention and management of contaminated land)
SEPP WoV	state environment protection policy (water of Victoria)
WA	works approval

Definitions

Anaerobic	an oxygen-free environment
Beneficial use	any segment of the environment that provides public benefit, health or enjoyment and requires protection from harm
Best practice	EPA-defined process or treatment requirements for industry to manage emissions to the environment
Biocides	a poisonous substance used to control harmful organisms either chemically or biologically (e.g. insecticides, herbicides)
Biogas	gas, primarily methane and carbon dioxide, liberated from an anaerobic pond that can be captured and converted into energy
Climate Change Adaptation Measures	proposed design measures and/or future contingencies to allow a proposal to operate as planned with altered environmental conditions under a future changed climate
Climate Change Resilience	consideration of whether a proposal can operate as planned with altered environmental conditions under a future changed climate
Effluent	liquid waste produced from the operation of a piggery.
Industrial wastes	any waste arising from commercial, industrial or trade activities, as defined by the EP Act 1970
Leachate	liquid waste generated from solid waste handling/storage areas and /or mortality composting areas
Nutrients	a substance necessary for plant or animal growth, i.e. phosphorus, nitrogen and potassium
Pig class	a description of pig type by physiological or growth stage, such as dry sow, farrowing or lactating sow, gilt, boar, piglet or sucker, weaner, grower or finisher
Public health	public health can be impacted by the environment, and therefore it is a beneficial use which the EPA is mandated to protect
Reuse area	land where effluent, manure or composted bedding materials and mortalities are applied to it for crop or pasture growth
Separation distance	the area between an emission source (e.g. piggery complex or reuse area) and a sensitive receptor (amenity e.g. houses, towns, schools, residential area)
Solid waste	waste includes manure, bedding material, waste feed and composted mortalities
Total solids	the quantity of dry solids in a mixture
Volatile solids	the quantity of total solids burnt/lost when a mixture is heated to 600˚C for 1 hour. It is a measure of the biodegradable organic solids content in the mixture.

Appendix 1 Checklist for preparing WA exemption and WA applications

Issue	Type of piggery[1]	Exemption	WA	Guideline reference Part / Heading no
Apply for a WA exemption	all	Check requirements are met & provide information using this list		A / 2.4
Has a risk assessment been completed?	all			A / 2.7
Has a planning permit been granted or an application lodged?	all	Must have a valid planning permit	Can obtain a planning permit after granting a WA	B / 3
Has stakeholder/community engagement been undertaken?	all	Must be conducted prior to submitting application	Can conduct prior to or during the WA assessment period	B / 6
Has the general information been provided? • primary information • land use • site specific information • track record	all	 √ √ √ (must be an existing site) √	 √ √ √ (N/A for new site) √	 B / 2 B / 3 B / 4 B / 5
Has the project description been provided?	all	√	√	B / 7 & 8
Is the proposal resilient to projected altered environmental conditions under climate change and what, if any, climate change adaptation measures are proposed?	all	√	√	B / 7
Do the processes and technologies selected demonstrate industrial best practice?	all	Need to describe best practice for key issues identified	Need to describe best practice for key issues identified	B / 8.2
If conflicting environmental goals have been identified, has an integrated environmental assessment been completed?	all	X	√	B / 8.3
What are key environmental issues identified: • climate change • energy and greenhouse • water resources • air (odour) emission • noise • stormwater collection • design and management of contaminated stormwater run-off on-site to protect surface water • adequate design wastewater process and management proposed • land and groundwater impact • adequate solid waste facility design and management proposed • mortality management • third party reuse	 all all all all all C & D all C all D all C & D	Need to address design and management practice for key issues identified	Address all the issues listed where appropriate	 B / 7 B / 8 B / 9 B / 10 B / 11 B / 12.3.1 B / 12.3.2 B / 12.3.3 B / 13.3 B / 14.3 B / 14.3 B / 15
Has an EMP been developed and provided?	all	Must submit	Can submit after WA	B /16 & Appendix 3

Note:
1. C = conventional sheds, D = deep litter sheds & O = outdoor rotation

Appendix 2: Risk assessment

Aspect	Considerations	Guideline reference Part / Heading no
Community amenity	- Evaluate the available separation distances to nearby houses, towns and other sensitive receptors - Assess whether significant impacts (i.e. odour and noise) to amenity are likely - If so, consider what changes in size, siting, design or management could minimise impact	B / 10 & 11
Surface water	- Evaluate the likelihood of surface water quality impacts from the operation of the piggery now and projected under climate change - If impacts are likely, consider how to change the size, siting, design or the management of the piggery to protect surface water quality and beneficial use	B / 12
Land and groundwater	- Assess whether groundwater quality could potentially be compromised by the operation of the piggery - If impacts are likely, consider how to change the size, siting, design or the management of the piggery to protect land, groundwater quality and beneficial use. For example: o best practice solid waste management facility and/or fit for purpose wastewater treatment design / installations required o solid and/or liquid application rates and land requirements o managing third party reuse required	B / 13 & 14 B / 13 & 14 B / 14 B / 15
Soils	- Identify and evaluate the potential impacts to soils through nutrient and salt addition, chemical use on site, pH considerations, and erosion and compaction	B / 13 & 14
Land availability	- Evaluate whether third party reuse required.	B / 13
Flood level	- Evaluate whether a new proposed piggery is located on a flood plain. If so, should consider moving to a new site now and projected under climate change - Evaluate whether a piggery expansion is located on a flood plain now and projected under climate change. If so, should consider potential impacts on waterway and neighbour land and design and management measures	B 12

Note: please also refer to Figure 1.

Appendix 3: Environmental management plans for piggeries

EMP section	Details of each section	Guideline reference Part / Heading no
1. Piggery description		
	Site description Existing and proposed operation	B / 2 – 4 B 7 and 8.1
2. Environmental objectives and approvals		
Objectives	State what the EMP is trying to achieve and environmental performance standards to comply with, including the requirements in state environmental protection policies	B / 9.2, 10.2, 11.2 12.2, 13.2, 14.2 & 15.2
Approvals	State what approvals have been granted for the piggery, including any permit exemptions or caveats, i.e. - planning permit - works approval exemption, etc.	
3. Environmental risk and management		
Risk assessment and management practice	List all the environmental risks / issues identified and management practices to control the risks proposed in a works approval application. For example: - climate change - energy and greenhouse - water resources - air (odour) emission and management - noise emission and management - stormwater collection - design and management practice for contaminated stormwater run-off on-site to protect surface water - design wastewater process and management - land and groundwater impact consideration and reuse management - solid waste facility design and management - mortality management - chemical handling and storage	B / 7 B / 8 B / 9 B / 10 B / 11 B / 12.3.1 B / 12.3.2 B / 12.3.3 B / 13.3 B / 14.3 B / 13.3
Corrective actions	Specify corrective actions if non-compliance or environmental incident occurs	
Non-routine operation and contingency plan	There are circumstances where a proposed piggery will have non-routine operations. Examples are plant break down and power supply failure, etc. A contingency plan for addressing those unpredicted situations is required	B / 16.2
4. Third party reuse and Duty of Care Statement		
	If third party reuse is to occur, issues including those listed in the guideline need to be addressed	B / 15.2
5. Monitoring and review		
Monitoring	List monitoring activities, such as reuse application rates, and soil and groundwater testing, including the person responsible, monitoring locations, and the type and frequency of monitoring. Also include situations where additional monitoring would be required, such as changes to effluent application rates or where a potential environmental risk is being observed through the previous monitoring data collected	

	Common monitoring activities are as follows Soils (monitored at least every two years): pH, EC, available phosphorus, phosphorus absorption capacity, potassium, sulphur, organic carbon, chloride, exchangeable cations. Nitrate-nitrogen should be monitored annually Effluent (monitored annually): total nitrogen, ammonium-nitrogen, nitrate-nitrogen, total phosphorus, ortho-phosphorus, potassium, EC, sodium absorption ratio (SAR) Solid waste (monitored annually): dry matter, pH, EC, organic carbon, total nitrogen, C:N ratio, ammonium-nitrogen, nitrate-nitrogen, total phosphorus, ortho-phosphorus, chloride, potassium, sodium	
Record keeping[1]	Describe what records will be kept, which should include reuse of effluent and solid waste, soil testing, groundwater monitoring, gaseous emissions and mass mortality events All applications of piggery effluent, manure and spent bedding, including third party reuse, shall be recorded. Records should include location, date, application rate, quality, method of application and weather conditions	
Auditing	Describe how the EMP shall be audited, the person responsible and the frequency	
EMP review	The EMP should state the person responsible for this and the frequency	
6. Environmental training		
	State what environmental training is required for staff, and the frequency of this training. Include a training record	
7. Plans (include the following)		
Zoning plan	Show the zoning of the subject property and surrounding land	
Topographic plan	Show watercourses and drainage lines; flood lines; protected land; and location of sensitive receptors	
Recent aerial photograph		
Whole site layout	Show current land uses; proposed piggery developments; on-farm roads; location of farm bores (or proposed bores); and location of any soil conservation or drainage works.	
Piggery plan	- Conventional/deep litter: location of by-products treatment and storage facilities, handling yards, feedmill, carcass composting area and other facilities. Include any proposed vegetation plantings/screenings - Rotational outdoor: location of paddocks, shelters, feeding and watering points, wallows, handling yards, feedmill, carcass composting area and other facilities. Include any proposed vegetation plantings/screenings	
Separation distances plan	Show perimeter of piggery complex and separation distances to sensitive land uses (e.g. houses and towns), as well as buffers around sensitive natural resources	

Note: EPA may require piggery to generate reports to check environmental compliance and for complaints management.