



## Application for licence

### Division 3 Part V of the *Environmental Protection Act 1986*

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<b>Licence number</b>	L9290/2021/1
<b>Applicant</b>	Yornaning Grazing Pty Ltd
<b>ACN</b>	633 449 082
<b>DWER file number</b>	DER2021/000084
<b>Premises</b>	Wyatt's Piggery 15983 Great Southern Highway YORNANING WA 6311
<b>Date of report</b>	13 June 2023
<b>Status of report</b>	Final

## 1. Purpose and scope of assessment

Yornaning Grazing Pty Ltd (the applicant) is seeking retrospective approval to operate, and approval to expand, its existing piggery complex near Cuballing. A licence application was submitted under Division 3 Part V of the *Environmental Protection Act 1986* (EP Act) on 8 February 2021.

This report sets out the delegated officer's assessment of potential risk events arising from emissions and discharges that are generated from existing piggery operations at the premises.

In completing the assessment documented in this report, the department has considered and given due regard to its regulatory framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

## 2. Application details

### Overview of existing premises

'Wyatt's Piggery' is an existing intensive piggery complex in the small rural location of Yornaning, about 150 km southeast of Perth.

The existing premises comprises a mixed indoor piggery complex (conventional sheds and deep litter shelters) with a combined design capacity of 2,091 standard pig units (SPUs). The piggery is certified under the Australian Pork industry-sponsored quality assurance program (APIQ), which requires the operator to have in place all relevant state and local government approvals to operate.

Table 1 describes the prescribed premises category the application is subject, as defined in Schedule 1 of the Environmental Protection Regulations 1987.

**Table 1: Prescribed premises category**

Classification of premises	Assessed design capacity (as per application)
Category 2: Intensive piggery: premises on which pigs are fed, watered and housed in pens.	Existing: not more than 2,289 animals (2,091 SPUs equivalent)
	Proposed expansion: not more than 5,051 animals (4,893 SPUs equivalent)

### Background

The applicant established and has operated the piggery complex since 2008 and has undertaken incremental expansion works since this time. The piggery operations and expansions have not been subject to a works approval, or planning approvals issued by the Shire of Cuballing (shire).

The applicant sought, and was granted, retrospective planning approval from the shire in December 2020 for current operations, and expansion works to more than double capacity to 5,039 SPUs.

### Existing piggery design and operation

The existing piggery complex comprises a 263-sow farrow-to-finish operation, in which animals are bred and initially reared in conventional indoor sheds, before being transferred to deep litter shelters for weaning and grow out.

#### Conventional sheds

There are three conventional indoor sheds with walls that comprise half solid, half nylon curtain, iron roofing and slatted flooring over concrete under-floor pits. The farrowing shed has under-floor pits that require regular manual flushing; the new dry sow shed has slatted flooring with pull-plug flushing system; the old dry sow shed has a solid concrete floor that requires

regular manual flushing. Piggery effluent is flushed via gravity through concrete pipes to a two-pond system, comprising an uncovered anaerobic pond and a holding pond.

There is no primary screening in place – solids are settled within a primary (anaerobic) pond, with overflow to a secondary (holding) pond. Wastewater disposal is currently via evaporation only, which is enabled by the local climate (high annual moisture deficit, i.e., low rainfall and high evaporation). The anaerobic pond is desludged about every two years, with sludge temporarily stockpiled in paddocks on the premises (no drying or dewatering), before being spread over cropping areas (see below).

#### Deep litter shelters

There are 11 deep litter shelters that each comprise a hooped structure with canvas roofing over a concrete base and straw used for bedding.

One shelter is used for keeping dry sows; three are for keeping ‘weaners’; six are for keeping ‘grower-finishers’; and one is for weighing animals. Up to 72 animals are kept in the dry sow shelter; up to 200 weaners are kept in each of the 3 weaner shelters (7 x 12 m; design capacity 250<sup>1</sup>); up to 200 grower/finishers are kept in each of the 3 small grower-finisher shelters (9 x 22 m; design capacity 282<sup>2</sup>); and up to 200 grower/finishers are kept in each of the 3 large grower/finisher shelters (9 x 30 m; design capacity 315<sup>3</sup>).

Spent bedding is removed from each individual shelter about every eight weeks and stockpiled on a hardstand pad (see below).

#### Herd size and housing

**Table 2: Existing piggery – herd size and housing**

Pig class	SPU factor	Pig numbers	SPUs	Housing
Gilt (100 – 160 kg)	1.8	20	36	Deep litter
Boar (100 – 300 kg)	1.6	6	9.6	Conventional
Dry sow (160 – 230 kg)	1.6	140	224	Conventional
		73	116.8	Deep litter
Lactating sow (160 – 230 kg)	2.5	50	125	Conventional
Sucker (1.4 – 8 kg)	0.1	400	40	Conventional
Weaner (8 – 25 kg)	0.5	600	300	Deep litter
Grower (25 – 55 kg)	1.0	600	600	Deep litter
Finisher (55 – 100 kg)	1.6	400	640	Deep litter
<b>Total</b>		<b>2,289</b>	<b>2,091.4</b>	

#### Solid waste management

Spent bedding is managed by stockpiling in static piles (i.e., aged) on a manure hardstand pad at the southern end of the piggery complex, before being spread over paddocks on the premises once per year. Pond sludge is also spread over paddocks once every two years. The paddocks are then cropped every year over the following four years with a cropping program comprising oaten hay, oats and straw, barley and straw, and canola.

About 241 ha is available for spreading; it is unclear whether spent bedding and pond sludge is applied to land at sustainable rates (i.e., in accordance with a nutrient mass balance to determine appropriate spreading rates for each nutrient) and in a manner that protects the environment, or if it is simply spread, with limited consideration or concern for nutrient loading.

<sup>1</sup> Minimum floor area of 0.338 m<sup>2</sup> per weaner (25 kg bodyweight), or 124 SPUs.

<sup>2</sup> Minimum floor area of 0.702 m<sup>2</sup> per grower/finisher (75 kg bodyweight), or 282 SPUs.

<sup>3</sup> Minimum floor area of 0.858 m<sup>2</sup> per grower/finisher (100 kg bodyweight), or 503 SPUs.

Mortalities are processed on the same manure hardstand pad, in which a portion of the spent bedding material is used as a carbon source. Processed mortalities material is also spread over paddocks; similarly, it is unclear whether this is done at appropriate spreading rates for each nutrient.

### Animal feed manufacturing

Rations are prepared on the premises using a tractor-driven, portable hammermill, with associated commodity storage, handling and ration delivery infrastructure. The capacity of the hammermill is about 3.2 t/hr (25.2 t per 8-hour work day).

Grains, such as lupins, barley and wheat, are grown on the premises and stored in silos along with canola meal (sourced off-site). Additives, such as meatmeal, bloodmeal, fishmeal, soybean meal, tallow and minerals are stored within a large mixing shed on the premises.

Rations are milled and mixed in 2.8 t batches, with about 1,300 t/yr produced for current operations. Five diet formulations are produced for each stage of animal growth. Rations are transferred, as mash, to silos in the piggery using the portable hammermill.

### **Proposed piggery expansion**

The applicant proposes to more than double the existing design capacity of the premises, to 4,893 SPUs, by constructing the following additional infrastructure:

- two new conventional sheds – a new farrowing shed, and a new dry sow shed will be built adjacent to, and will complement, the existing farrowing and dry sow sheds. The sheds will comprise slatted flooring and underfloor pull-plug flushing system (similar to the existing sheds);
- two new conventional finisher sheds (separate to existing sheds), with two new clay-lined effluent ponds; and
- nine new deep litter shelters.

### Herd size and housing

Table 3 summarises the herd size for the proposed expansion, by pig class, and where they will be housed. The design capacity for the expanded operation is tabled in Appendix A.

**Table 3: Proposed expansion – herd size and housing**

Pig class	SPU factor	Pig numbers	SPUs	Housing
Gilt (100 – 160 kg)	1.8	37	66.6	Conventional
Boar (100 – 300 kg)	1.6	6	9.6	Conventional
Dry sow (160 – 230 kg)	1.6	271	433.6	Conventional
		140	224	Deep litter
Lactating sow (160 – 230 kg)	2.5	89	222.5	Conventional
Sucker (1.4 – 8 kg)	0.1	878	87.8	Conventional
Weaner (8 – 25 kg)	0.5	1,230	615	Deep litter
Grower (25 – 55 kg)	1.0	1,010	1,010	Deep litter
Finisher (55 – 100 kg)	1.6	1,390	2,224	Conventional
<b>Total</b>		<b>5,051</b>	<b>4,893.1</b>	

### Effluent management

The applicant proposes to direct effluent from the new farrowing and dry sow sheds to the existing pond system, which will more than double current influent volumes of 2.5 kL/day to about 6 kL/day (increase of about 3.5 kL/day). With the increase in influent, expected sludge accumulation rates and treatment capacity, the applicant estimates the required capacity of the anaerobic pond is 1,130 m<sup>3</sup>, which is about half of the current pond capacity (2,400 m<sup>3</sup>).

The two new finisher sheds are expected to generate about 15 kL/day of effluent; the applicant estimates the new anaerobic pond requires an effective treatment capacity of about 2,680 m<sup>3</sup>, which includes desludging about every 4 years.

The applicant proposes to now manage effluent from the existing and proposed secondary (holding) ponds by irrigating over dryland cropping land on the premises – which is a significant change from existing practices. About 5,400 kL/yr of effluent is proposed to be irrigated, equating to an average of 31 kL/ha/yr. The applicant advises effluent will be routinely irrigated, but only when the soil is sufficiently dry to absorb the water; although no information has been provided on how soil moisture levels will be determined.

A four-yearly cropping program will be used as part of the offtake strategy, which also includes spreading processed mortalities over the same land area (see below); the nutrient budget provided by the applicant indicates at least 175 ha is required to ensure sustainable re-use of effluent and processed mortalities under the proposed cropping rotation. The budget also indicates in years where canola is grown there will be a minor surplus of phosphorus (P); however, according to the applicant, any excess will be taken up by oaten hay crop the following year.

#### Mortalities management

Mortalities will continue to be processed (pasteurised) on the manure hardstand pad at the southern end of the piggery complex and managed in conjunction with spent bedding stockpiles. The applicant considers the existing pad is of sufficient size for managing the number of mortalities and the amount of spent bedding from the expansion proposal.

The applicant expects about 155 t/yr of processed mortalities material to be generated; assuming a moisture content of 40%, about 88 t/yr of material will be produced. The nutrient budget provided by the applicant indicates a minimum of 43 ha is required to ensure sustainable re-use of processed mortalities material under the proposed cropping rotation; the applicant proposes to apply this material at a rate of 1.5 t/ha over the same land area on which effluent will be irrigated.

#### Pond sludge management

The proposed and existing anaerobic ponds will now be desludged at least every 2 years, using a vacuum tanker, to prevent sludge from accumulating and compacting and to limit damage to the pond liner. About 161 m<sup>3</sup>/yr is expected to be removed from the existing breeder site pond and 382.5 m<sup>3</sup>/yr from the proposed finisher site pond (543.5 m<sup>3</sup>/yr total).

The nutrient budget provided by the applicant indicates at least 830 ha is required to ensure sustainable re-use of sludge under the proposed cropping program; given there is only 241 ha available on the premises and 175 ha is already allocated for disposal of effluent and processed mortalities, the remaining 66 ha means there is insufficient land to sustainably use the nutrients within the pond sludge that will be generated annually at the proposed expanded capacity.

Up to 8% of the available pond sludge (43.5 m<sup>3</sup>) can be sustainably spread at a conservative rate of 0.8 m<sup>3</sup>/ha/yr, with the remaining 92% (500 m<sup>3</sup>) to be directly removed off-site for further processing or disposal.

#### Solid waste management

Spent bedding will continue to be stockpiled on the manure hardstand pad at the southern end of the piggery complex and managed in conjunction with processing mortalities.

The applicant considers the existing pad is of sufficient size to store the amount of spent bedding generated from the 11 existing and 9 additional shelters (about 735 t/yr total); assuming a moisture content of 60%, this equates to about 513 t/yr of dry material that will require managing and disposal.

A portion of the spent bedding will continue to be used as a carbon source for processing mortalities (about 114 t/yr), with the remainder allowed to age for at least 2 years.

The nutrient budget provided by the applicant indicates at least 471 ha is required for sustainable re-use of spent bedding under the proposed cropping rotation; the applicant acknowledges that after considering the land already being used for disposal of effluent and processed mortalities, there is insufficient land available to sustainably use the nutrients within spent bedding that will be generated annually at the proposed expanded capacity.

Up to 14% of the available spent bedding (71.8 t, dry) can be sustainably spread at a rate of 1.1 t/ha/yr, with the remaining 86% (441.2 t, dry) to be directly removed off-site for further processing or disposal.

### Nutrient management

The applicant has determined that P is the limiting factor for sustainable spreading of pond sludge and spent bedding and has prepared a cumulative nutrient budget for application of these wastes over 5 – 6 years of cropping; however, the rate of application appears to have been calculated over 170 ha, rather than the remaining 66 ha.

The budget indicates up to 50 kg/ha of sludge can be spread once every 5 years, or about 30 kg/ha of spent bedding once every 3 years (the department does not agree with this statement; see Comparison with the NEGIP, below).

Whichever waste type (or combination) is applied to land, the budget indicates there will always be excess P, which the applicant expects to be stored in the soil and taken up by the following years' crop.

The applicant considers the P export risk for soils on the premises to be low, and therefore considers their proposed strategy “does not present a significant environmental risk” (the department also does not agree with this statement; see Comparison with the NEGIP, below).

### **Exclusions to this assessment**

The following matters are out of the scope of this assessment and have not been considered within the risk assessment detailed in this report:

- other general farming activities being conducted on the premises outside of solid waste utilisation areas;
- vehicle (i.e., livestock truck) movements on private or public roads; and
- land use zoning and compatibility with surrounding land uses.

## **3. Industry guidelines**

The *National Environmental Guidelines for Indoor Piggeries* (NEGIP) (Australian Pork Ltd 2018) provides a general framework for managing the environmental issues associated with indoor piggeries in Australia.

The criteria outlined in Appendix A of the NEGIP has been used as a baseline for rating the vulnerability of major natural resources from the existing piggery operations and the risk of environmental impacts from the existing design and operational features.

Table 4 provides a summary of the risk of the existing piggery using the NEGIP criteria, where 1 is low risk and 4 is high risk.

**Table 4: Summary of Wyatt’s Piggery against NEGIP criteria**

NEGIP aspect	Risk criteria	Risk rating
<b>Soils of reuse areas</b>		
Soils of reuse areas	Reuse areas:	
	• are suited to growing a broad range of broad acre crops and pastures	1
	• have a soil depth of at least 1 m	1
	• have soils that are non-rocky, non-saline and non-sodic	3

	<ul style="list-style-type: none"> <li>• have soils that are sandy in texture</li> </ul>	4
	<ul style="list-style-type: none"> <li>• are not prone to waterlogging</li> </ul>	1
	<ul style="list-style-type: none"> <li>• flood at a frequency of less than once every ten years</li> </ul>	1
	<ul style="list-style-type: none"> <li>• have slopes that promote infiltration, rather than runoff or erosion</li> </ul>	1
Groundwater quality and availability	Depth to groundwater always at least 20 m below the ground surface or the base of any piggery infrastructure	1
Surface water quality and availability	The piggery is located at least 200 m from the closest watercourse	1
	The piggery is located at least 800 m from the closest major water supply storage	1
	Reuse areas comply with the buffer distances specified in the NEGIP	2
	The piggery is located above the 1:100 year flood line	1
	Reuse areas are located above the 1:100 year flood line	1
Community amenity	The piggery has received no complaints from the public or regulators for at least five years	1
	Levels of odour, dust and noise around the property boundary area not routinely monitored	4
	Surrounding land is all designated rural and is not designated for future development or rezoning	1
	The piggery is fairly well concealed from roads and neighbours	2
	Vehicle movements and other noisy activities occur only during the day, except under exceptional circumstances	1
	Mechanical equipment used on-farm is generally fitted with manufacturer specified exhaust devices	2
	Dust from traffic movements, manure handling and reuse and feed milling is not specifically controlled but dust does not seem to cause nuisance	2
	A complaints management procedure is in place, but does not include complaints recording, investigation and corrective action, along with appropriate consultation	2
	Mediation is used to try to settle disputes with neighbours	Unknown
<b>Design and operation</b>		
Pig housing	The conventional sheds are oriented east-west and are constructed to maintain temperatures within the required range with minimal mechanical heating or cooling	2
	The deep litter sheds are oriented east-west and constructed to maintain temperatures within the required range with no mechanical heating or cooling	1
	The sheds bases are concreted for both the conventional and deep litter sheds	1
	Feeding systems rarely allow feed to be visible on the floor or in the bedding near the feeders	2
	Naturally ventilated sheds are not well ventilated, as they are not separated by a distance of at least 3 times their height	4
	Stocking densities meet the requirements of the Model Code	1

	of Practice for the Welfare of Animals: Pigs	
	Conventional sheds are regularly cleaned to maintain very clean lanes, pens and handling areas: pigs are generally clean	2
	The bedding in deep litter sheds are mostly kept dry and friable; pigs are generally clean	2
	The inflow or outflow of effluent from conventional sheds is prevented by controls	1
	Water is not used to washdown deep litter housing after spent bedding removal	Absent
Nutrient content of manure	The quantities of nutrients in effluent and manure that will be applied to land are estimated using general data in publications	3
Effluent collection system	Stormwater runoff, including roof runoff is excluded from entering the effluent collection system	1
	Effluent collection systems (e.g. channels, drains, pipes and sumps) for conventional sheds are impervious (no significant cracks)	1
	Effluent pits, sumps, pipes and drains are sized and managed so that they do not spill	1
	Effluent pits and drains are not self-cleaning, but are cleaned at least weekly to remove manure solids	2
	There are no specific contingency measures to prevent spills from the system	4
	Flushing channels are flushed at least twice a week, and pull plugs are emptied at least once every 4 weeks	3
	Drains, pits and sumps are inspected at least monthly for solids accumulation, leakage and deterioration	3
Effluent pre-treatment system	There is no effluent pre-treatment system in place	Absent
Effluent treatment system	The effluent treatment system:	
	<ul style="list-style-type: none"> <li>is designed to capture and store all effluent. It has no significant isolated sections. Inlets and outlets are positioned to minimise short-circuiting</li> </ul>	2
	<ul style="list-style-type: none"> <li>sometimes produces strong odours, but these don't generally impact beyond the property boundary</li> </ul>	3
	<ul style="list-style-type: none"> <li>is designed to store at least 2 years sludge</li> </ul>	3
	<ul style="list-style-type: none"> <li>is lined with compacted clay</li> </ul>	3
	<ul style="list-style-type: none"> <li>is designed for an overtopping frequency not exceeding 1 in 20 years where effluent disposal is by evaporation</li> </ul>	1
	The depth to the water table from the base of the effluent treatment system is at least 2 m	1
Solid waste storage	Solid waste storage areas sit within a controlled drainage area, and all leachate is directed to a storage designed to receive this inflow	1
	The base of solid waste storage areas are impervious (clay compacted to $1 \times 10^{-9}$ m/s for a depth of 300 mm)	1
	The depth to water tables beneath the base of manure storage areas exceeds 2 m at all times	1



	Stockpiles are generally managed to maintain low odour emissions	2
Mortalities management	Dead pigs are almost always removed from the sheds or pens daily	2
	Mortalities management always occurs within 36 hours of death	2
	Mortalities management is by composting	1
	Mortalities management areas always provide at least 2 m depth between base level and groundwater	1
	Mortalities are always promptly covered with at least 300 mm of spent bedding and continuously kept covered	1
	Mortalities management occurs within a controlled drainage area	1
	In the case of a mass mortalities event, there is a suitable site selected but no real plan for managing mass mortalities	3
Reuse areas	The nutrients in effluent and manure are budgeted to ensure they are applied at rates that are based on nutrient removals by crop or pasture harvest using generic yields	3
	Nutrient export from reuse areas is not specifically prevented	4
	Effluent irrigation occurs when the soil is dry enough to absorb the water	3
	Effluent and manure are spread somewhat evenly, but generally only spread when active plant growth is expected	3
	High-pressure spray guns are not used	1
	Flood irrigation is not used	N/A
	Effluent and manure are spread at any time of the day, but not normally on weekends or public holidays	3
	Soils of reuse areas are not regularly tested	4

## Comparison with the NEGIP

### Siting and design

- The existing piggery complex is sited on priority agricultural land and is well separated from populated areas. Its location in a climate with high annual moisture deficit (i.e., low rainfall and high evaporation) further reduces the risk of common environmental issues associated with wet conditions, such as managing effluent during the wetter months.
- Key piggery infrastructure adjoins a large block of remnant vegetation that comprises a nationally recognised threatened ecological community (TEC) – the Eucalypt Woodlands of the WA Wheatbelt, which is listed as critically endangered under federal environmental protection laws (*Environment Protection and Biodiversity Conservation Act 2016*). Protection of this vegetation complex from ongoing piggery operations is therefore critical.
- The design and operation of the conventional piggery sheds appears to be consistent with the NEGIP from an animal welfare standard, in terms of stocking densities, ventilation and general animal cleanliness and husbandry. However, the design and construction standard of the existing wastewater treatment infrastructure is unclear, due to the lack of construction materials testing and construction certification details. According to the applicant the existing ponds were constructed using in situ soils – no other information is available except the applicant advising the material has ‘set very hard’.
- The applicant also indicates the walls of the existing anaerobic pond were ‘lifted’ in 2019 to increase treatment capacity – it is unclear to what design and construction standard this was completed to and whether the pond is fit for purpose, or what risk this pond

poses to the adjacent vegetation (TEC) from leakage or failure, overtopping, etc.

- Due to a lack of pre-treatment or solids screening, the anaerobic pond requires more frequent desludging and disturbance than a system that has this in place; this increases the risk of odour events.
- The design and operation of the deep litter shelters appears to be consistent with the NEGIP, with exception of the shelters not being washed out after spent bedding is removed, which accounts for the lack of containment infrastructure for managing wash water.
- The proposed design, construction standard and operation of the new conventional sheds, effluent ponds and deep litter shelters all appear to be consistent with the NEGIP.

#### Waste management

- Solid waste storage and processing appears to be consistent with the NEGIP, although the design and construction standard of the existing pad is unclear, due to the lack of materials testing and construction certification details. Processing dead animals by composting is the most preferred option under the NEGIP for managing mortalities;
- The proposed management of effluent via irrigation, in conjunction with the spreading of processed mortalities, at the proposed application rates, appears to be sustainable with the proposed offtake strategy (4-yearly cropping program); however, it is noted the nutrient budget calculations are based on generic values instead of site-specific data – actual on-farm nutrient concentrations may vary significantly;
- There is insufficient land remaining on the premises for spreading the annual amount of spent bedding and pond sludge generated from current operations (much less the expansion); the proposal to spread only a portion of either pond sludge or spent bedding over the remaining available land on the premises at rates 4-5 times of that calculated as being sustainable for phosphorus in a once-off application every 4-5 years, is problematic – there being an expectation that applied nutrients will simply remain stored in the soil and wait to be used up each year – this strategy does not consider potential nutrient leakage to groundwater and other forms of degradation during the course of each 4-5 year period;
- Excess solid waste must be removed from the premises – if the solid waste comprises raw or unprocessed solids, then additional properties must be identified in advance and the suitability of those properties must firstly be determined in the same manner as this assessment, including calculation of application rates based on soil-landscape characterisation and soil testing. However, if the waste has been processed to significantly reduce pathogens, it may be taken off the premises without the need for additional approvals.

#### Nutrient management

- Standard industry practice for an established piggery is to test effluent and manure prior to the main reuse period to ensure the wastes can be spread at appropriate and sustainable rates. The removal of applied nutrients also varies depending on crop type and yield, soil types, the initial and final nutrient status of the soil and growing season (winter) rainfall. As this piggery is an established facility, it is assumed that soil, effluent and manure sampling and testing records are available – this data should be used in all nutrient budget calculations (instead of generic data from PigBal 4.0) and would improve both accuracy and confidence of these calculations;
- The offtake strategy for managing spent bedding and pond sludge is unclear – the maps suggest 66 ha is available for spreading spent bedding and pond sludge, however, the additional information refers to spreading spent bedding over 175 ha every 3 years (or 471 ha annually) and sludge over 170 – 210 ha every 4 – 5 years (or 830 ha annually). It is therefore unclear what proportion of these wastes will be spread on-site and what will be taken off-site – the adequacy of the nutrient budget cannot be determined whilst there is uncertainty around the offtake plan;
- The total reuse area required to sustainably manage all wastes generated from piggery

operations significantly exceeds the area available within the premises. A total of 1,519 ha is required when considering each of the waste components, being effluent (175 ha), processed mortalities material (43 ha), pond sludge (830 ha) and spent bedding (471 ha). With only 471 ha of suitable land available within the premises for spreading, an additional 1,278 ha of additional land (off-site) is required on an annual basis;

- If the 500-sow farrow-to-finish piggery operation requires 1,519 ha of suitable land for sustainable management of the wastes that are generated, then the current 200-sow operation would require 40% (simple ratio) of this total area, or 537 ha (accounting for no irrigation of effluent from current operations), which indicates the current nutrient management system may not be operating in a sustainable manner
- A detailed nutrient management plan is required that outlines the appropriate sustainable manure application rates for each soil type and based on their crop rotation program, the crop to ensure the optimal removal of nutrients;
- Historical information of the application of fertilisers, manure spread rates, crop yields and annual soil tests (topsoil / subsoil) would confirm whether the current nutrient management system is operating in a sustainable manner, and they proposed utilisation areas have the capacity to assimilate the proposed increase nutrient application, without causing environmental degradation;
- A property-wide soil study (topsoil and subsoil) is required to determine the sustainable level of manure spreading for the premises. Whilst soil tests (0-10 cm) indicate the farm consists of sand, sandy loams and loamy sands, neither the physical nor chemical properties of these soil profiles are known;
- The cropping areas on the premises have previously been used for spreading spent bedding and pond sludge, with only soil testing results for the 0-10 cm topsoil profile provided in terms of baseline soil nutrient levels. It is unclear whether nutrient accumulation in the subsoil from past practices will affect the sustainable application of effluent and processed mortalities into the future;
- Several areas on which effluent and solid wastes are being applied are adjacent to seasonal watercourses and vegetation that comprises the Eucalypt Woodlands TEC (including the Yornaning Nature Reserve) – careful management, regular soil monitoring and adequate separation will be required to ensure that nutrient leakage to surface water and other forms of land degradation do not occur.

## 4. Other approvals

### Planning approvals

A conditional retrospective development approval (DA) for an intensive piggery was issued by the Shire of Cuballing (shire) in December 2020. The approval includes the expansion proposal and limits the development to 2,671 animals (3,062 SPUs) housed in conventional sheds and 2,380 animals (1,977 SPUs) housed in deep litter shelters.

## 5. Consultation

The application was referred to relevant public authorities and advertised for public comment on the department's website during June 2021.

### Public authorities

DPIRD reviewed the capability of the applicant to manage the amount of effluent and solid wastes produced, and provided the following comments:

- the applicant proposes to spread at higher rates once every 4 – 5 years with a plan to remove the nutrients over a period of 4 – 6 years; however, it is unclear whether this is achievable or sustainable, or if nutrient leaching will result, without a detailed soil profile analysis;
- the available soil tests (0-10 cm) indicate the farm consists of sand, sandy loams and

loamy sands, however, neither the soil profile nor the physical and chemical properties of these soils are known;

- a review of the winter biomass for the past 5 years indicates the premises can produce high yielding crops. However, without historical information of the application of fertilisers, manure spread rates, crop yields and annual soil tests (topsoil and subsoil), it is unclear whether the site will be able to sustainably handle higher applications of nutrients. A comprehensive soil study (to 600 mm depth) is required to establish a baseline for nutrient levels and the potential for phosphorus leaching;
- the statement that “most soils have the capacity to store significant quantities of phosphorus” is a generalisation and assumes that clay dominates all Western Australian soils. However, this is not the case and most Western Australian soils need to be assessed to determine their level of phosphorus storage capacity;
- accumulation of soil phosphorus should only occur within the plant root zone and only up to 95% of maximum soil storage capacity. Once P concentrations in soil have reached this level, no more phosphorus soil storage should take place;
- the application indicates most of the spent bedding and pond sludge will be removed for off-site spreading. The nutrient budget indicates 830 ha of land is required for sustainable reuse of one year of pond sludge. The applicant indicates if the soils of the premises can hold many years of P, then in the first year spreading over 170 – 210 ha can occur, and the soil P will be gradually removed over the next 4 – 5 years of cropping. Having locked up 210 ha of the premises in a single year, the applicant must spread the next 3 or 4 years of pond sludge off-site until the P from the first years’ application has been removed.

The shire confirmed it has issued retrospective planning approval (see above) and is unaware of any specific environmental issues relating to the existing piggery operation.

### **Public submissions**

No submissions were received during the advertised public comment period.

## **6. Risk assessment**

### **Determination of emission, pathway and receptor**

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020). To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

### **Risk ratings**

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account identified potential source-pathway and receptor linkages. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls, these have been considered when determining the final risk rating. Where the delegated officer considers the applicant’s proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the applicant’s controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in the below table.

## Risk assessment table

The table below describes the risk events associated with the proposal consistent with the *Guideline: Risk Assessments* (DWER 2020a). The table identifies whether the risk events are acceptable and tolerated, or unacceptable and not tolerated, and the appropriate treatment and degree of regulatory control, where required.

Risk Event				Consequence rating <sup>1</sup>	Likelihood rating <sup>1</sup>	Risk <sup>1</sup>	Reasoning	Regulatory controls	
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls						
<b>Category 2: Intensive piggery</b>									
Holding, feeding and watering of animals within <b>conventional sheds</b>	Nutrient-laden effluent (spilt feed, water, urine, faeces), accumulated in sheds	Seepage/infiltration, causing contamination of shallow groundwater	Applicant advises the existing conventional sheds comprise either a concrete base or concrete slatted floors with a pull-plug flushing system Effluent is flushed to a large anaerobic pond via PVC and concrete pipes The existing two ponds are clay-lined with in situ material	Low level on-site impacts <b>Minor</b>	Will probably not occur in most circumstances <b>Unlikely</b>	<b>Medium</b> Acceptable, subject to regulatory controls	The existing conventional sheds have been constructed with either a solid concrete floor or slatted flooring over concrete under-floor pits, which is consistent with the NEGIP. Effluent is either manually flushed from the pits or released using a "pull plug" system – both systems flush effluent from beneath the sheds to a two-pond system via a combination of PVC and concrete pipes. The pond system comprises a large anaerobic pond and a secondary, evaporation pond. The applicant advises both ponds are clay lined; however, it is unclear to what standard they have been constructed (depth of clay, compaction, permeability, etc.). According to the applicant, depth to groundwater in the area is about 13 m, with quality brackish to saline (non-potable). Soils are grey sandy duplex soils over clay subsoils. Providing the infrastructure is maintained to design standard, the ongoing risk of groundwater contamination from ongoing operation of the conventional shed complex appears to be acceptable.	- Infrastructure design and operational requirements specified in infrastructure table - All infrastructure must be maintained to ensure integrity is sustained	
			The new farrowing and dry sow sheds will be constructed with slatted flooring and underfloor pull-plug flushing system Effluent from the new sheds will be flushed to the existing two-pond system via PVC pipes The new finisher sheds will be constructed with slatted flooring and underfloor pull-plug flushing system Two new clay-lined ponds will be constructed, in which effluent will be flushed to via PVC pipes	Low level on-site impacts <b>Minor</b>	Will probably not occur in most circumstances <b>Unlikely</b>		<b>Medium</b> Acceptable, subject to regulatory controls	Construction of the new farrowing and dry sow sheds in the manner proposed is consistent with the NEGIP. Construction of the new finisher sheds and associated effluent treatment ponds, in the manner proposed, is consistent with the NEGIP. Pre-construction materials testing is required, to ensure the materials are suitable. Post-construction certification is required, prior to authorisation for stocking and operating the new sheds.	- Infrastructure design and construction requirements specified in infrastructure works table - Post-construction certification
		Overtopping of existing effluent treatment ponds, runoff causing impacts to health of immediately adjacent native vegetation (critically endangered TEC <sup>4</sup> ), surface water, soil contamination or groundwater contamination	Applicant advises the capacity of the existing effluent treatment ponds is sufficient to contain the volumes of effluent from the existing sheds and the new farrowing and dry sow sheds without the risk of overtopping Diversion of roof stormwater away from ponds	Short-term impact to an area of high conservation value <b>Major</b>	Will probably not occur in most circumstances <b>Unlikely</b>		<b>Medium</b> Acceptable, subject to regulatory controls	Based on the volume of influent from the 3 existing sheds (880 kL/yr), the annual water balance for the site indicates the ponds are designed with sufficient storage capacity to ensure the frequency of spill events are less than an average of one in 20 years, assuming that most of the stored effluent is evaporated during the spring and summer period (no discharge) and the pond is relatively empty at the start of each winter season. The site is located in a climate with high annual moisture deficit (i.e., low rainfall and high evaporation). According to the applicant, the existing pond system has never overtopped; the contingency if there is insufficient freeboard prior to a significant rainfall event is to tanker effluent off-site. It is estimated the volume of influent to the pond system will more than double with the additional farrowing and dry sow sheds, increasing from 880 to 2,186 kL/yr. With a maximum storage capacity of 2,400 m <sup>3</sup> , the delegated officer is satisfied the ponds are designed with sufficient storage capacity to contain the volumes of influent from the existing and proposed sheds, under normal	- Operational freeboard requirement of 0.5 m must be maintained on the evaporation pond - Stormwater must be diverted away from the ponds - Ongoing inspections of the ponds and their surrounds for integrity during operations

<sup>4</sup> The Eucalypt Woodlands are listed as a critically endangered Threatened Ecological Community (TEC) under the *Environment Protection and Biodiversity Conservation Act 2016 (Cth)*, and a Priority Ecological Community (PEC, P3) under the *Biodiversity Conservation Act 2016 (WA)*

Risk Event				Consequence rating <sup>1</sup>	Likelihood rating <sup>1</sup>	Risk <sup>1</sup>	Reasoning	Regulatory controls
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
							<p>operating conditions.</p> <p>The delegated officer is mindful of the ponds being located immediately adjacent to a critically endangered TEC, and that significant impacts to the health of this vegetation may result in the event of a pond spill or significant seepage over time.</p> <p>The delegated officer is also mindful the construction and design standard of the existing ponds are unclear, and whether the ponds are fit-for-purpose, noting the height of the holding pond walls were also raised in 2019.</p> <p>There are no known methods for determining the integrity of a pond that has already been built and no construction details or quality checks are available, nor have accurate water balance records been provided; other than accepting the applicant's word it is therefore difficult for the delegated officer determine with any level of confidence the existing ponds are fit-for-purpose for ongoing use.</p> <p>Conditions have therefore been added to require frequent inspections of the pond and its surrounds, to provide assurance over their ongoing integrity.</p>	
		Overtopping of proposed finisher site effluent treatment ponds, runoff causing impacts to health of immediately adjacent native vegetation (critically endangered TEC <sup>5</sup> ), surface water, soil contamination or groundwater contamination	<p>Ponds are designed with sufficient storage capacity, accounting for 4-yearly desludging</p> <p>Size of the ponds have been determined using Watbal modelling</p>	<p>Short-term impact to an area of high conservation value</p> <p><b>Major</b></p>	<p>Will probably not occur in most circumstances</p> <p><b>Unlikely</b></p>	<b>Medium Acceptable, subject to regulatory controls</b>	<p>The sizing for the new ponds has been developed using the Watbal modelling, which is considered an industry-accepted model. The delegated officer is therefore satisfied the information used in the model is appropriate and the calculated pond sizes are correct.</p> <p>The model indicates the required active pond volume for the anaerobic pond is 1,152 m<sup>3</sup>, with 4 years of sludge storage capacity of 1,530 m<sup>3</sup>, therefore, the total pond capacity required is 2,682 m<sup>3</sup>.</p> <p>The wet weather storage pond has been designed with a minimum storage capacity of 2,000 m<sup>3</sup>; this is considered sufficient, based on an estimated 4,744 m<sup>3</sup>/yr influent that will be regularly irrigated with some evaporation, except for winter storage during June-August.</p> <p>Post-construction certification of the completed ponds is required, prior to authorisation for accepting effluent from the new sheds.</p>	<ul style="list-style-type: none"> <li>- Infrastructure design and construction requirements specified in infrastructure works table</li> <li>- Post-construction certification</li> </ul>
	Odour, from effluent accumulated in conventional shed underfloor pits and effluent holding ponds	Unreasonable interference with the health, welfare, convenience, comfort and amenity of nearby sensitive receptors (5 within 5 km radius)	<p>Farrowing shed flushed once every 5 weeks</p> <p>Pull-plug system flushed once a week</p> <p>Ponds are desludged every 2 – 4 years</p>	<p>Low level off-site impacts to amenity</p> <p><b>Minor</b></p>	<p>Could occur at some time</p> <p><b>Possible</b></p>	<b>Medium Acceptable, subject to regulatory controls</b>	<p>The NEGIP recommends fixed separation distances of at least 250 m to rural dwellings and 750 m to a townsite. The closest rural dwelling is about 1.1 km southwest of the conventional sheds and four others within a 5 km radius. The nearest small town of Cuballing is about 5.6 km to the south.</p> <p>S-factor calculations for the expanded piggery (4,893 SPUs) indicate minimum separation to 914 m to rural dwellings, 1,192 m to rural residential zones and 1,986 m to a townsite. These distances are based on spent bedding being removed once every 7 weeks from the deep litter shelters.</p> <p>There is no recorded history of nuisance odour complaints according to the Shire of Cuballing from historical operations at this site; however, this alone is not an indicator that odour is not an issue.</p> <p>The absence of pre-treatment or solids screening is noted, where solids are flushed straight to the anaerobic pond. This will require more frequent desludging of the anaerobic pond (see below) and may increase the risk of off-site odour impacts.</p> <p>Providing the effluent collection system is managed according to NEGIP recommendations (i.e., frequent flushing, solids separation, daily visual checks for blockages, ponds desludged when required, etc.), and considering the lack of odour complaints from historical operations, the ongoing risk of off-site odour impacts from current</p>	<ul style="list-style-type: none"> <li>- Odour management in accordance with the NEGIP</li> </ul>

<sup>5</sup> The Eucalypt Woodlands are listed as a critically endangered Threatened Ecological Community (TEC) under the *Environment Protection and Biodiversity Conservation Act 2016 (Cth)*, and a Priority Ecological Community (PEC, P3) under the *Biodiversity Conservation Act 2016 (WA)*

Risk Event				Consequence rating <sup>1</sup>	Likelihood rating <sup>1</sup>	Risk <sup>1</sup>	Reasoning	Regulatory controls
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
							operations appears to be acceptable.	
	Odour, from deceased animals		Deceased animals are removed from pens daily	Low level off-site impacts to amenity <b>Minor</b>	Could occur at some time <b>Possible</b>	<b>Medium</b> Acceptable, subject to regulatory controls	Dead animals are composted on-site, which is the preferred method of disposal for managing mortalities under the NEGIP. The frequency of removal from the pens is also consistent with the NEGIP. Providing the minimum requirements outlined in the NEGIP are being implemented, the ongoing risk of off-site odour impacts from mortalities management appears to be acceptable.	- Dead pigs must be removed from pens within 24 hours of death; - Mass mortalities contingency plan must be in place
	Noise and dust, from animals and machinery movements		None specified	Low level off-site impacts to amenity <b>Minor</b>	Likely to occur only in exceptional circumstances <b>Rare</b>	<b>Low</b> Acceptable, not subject to controls	Some noise and dust is expected during piggery operations, with the nature of animal noise and machinery movements consistent with that expected from general farming activities in a rural area. There is sufficient separation in place (>1.1 km to nearest rural dwelling, >5.6 km to nearest populated area); it is not reasonably foreseeable that noise and dust will impact on the amenity of off-site human receptors.	None specified
Holding, feeding and watering of animals within <b>deep litter shelters</b>	Nutrient-laden leachate from spent bedding (spilt feed, urine, faeces), accumulated in shelters	Runoff causing impacts to health of immediately adjacent native vegetation (critically endangered TEC <sup>6</sup> ) Seepage/infiltration, causing contamination of shallow groundwater	Applicant advises the deep litter shelters comprise concrete base Shelters are not washed out after spent bedding removal	Short-term impact to an area of high conservation value <b>Major</b>	Will probably not occur in most circumstances <b>Unlikely</b>	<b>Medium</b> Acceptable, subject to regulatory controls	The deep litter shelters have been constructed with a concrete base, which is consistent with the NEGIP. It is noted shelters are not washed out or cleaned after spent bedding is removed, nor is there any infrastructure in place for containment of wash water, should this activity be conducted. Providing the deep litter shelters are managed according to NEGIP recommendations, the ongoing risk of groundwater contamination from ongoing operation of the deep litter shelters appears to be acceptable.	- Infrastructure design and operational requirements specified in infrastructure table - All infrastructure must be maintained to ensure integrity is sustained
	Odour, from animals and spent bedding accumulated in shelters	Unreasonable interference with the health, welfare, convenience, comfort and amenity of nearby sensitive receptors (5 within 5 km radius)	Spent bedding is removed from pens about every 8 weeks	Low level off-site impacts to amenity <b>Minor</b>	Could occur at some time <b>Possible</b>	<b>Medium</b> Acceptable, subject to regulatory controls	The NEGIP recommends fixed separation distances of at least 250 m to rural dwellings and 750 m to a townsite. The closest rural dwelling is about 1.1 km southwest of the conventional sheds and four others within a 5 km radius. The nearest small town of Cuballing is about 5.6 km to the south. S-factor calculations for the expanded piggery (4,893 SPUs) indicate minimum separation to 914 m to rural dwellings, 1,192 m to rural residential zones and 1,986 m to a townsite. These distances are based on spent bedding being removed once every 7 weeks from the deep litter shelters. There is no recorded history of nuisance odour complaints according to the Shire of Cuballing from historical operations at this site; however, this alone is not an indicator that odour is not an issue. It is noted the shelters are not washed or rinsed out after spent bedding is removed, which may increase the risk of odour generation and off-site impacts. However, it is generally accepted that washing out shelters is not required in climates with an annual moisture deficit. Providing the deep litter shelters are managed according to NEGIP recommendations, the ongoing risk of off-site odour impacts from ongoing operations appear to be acceptable.	- Maximum stocking numbers specified for each size shelter - Spent bedding must be removed once every 7 weeks from deep litter shelters
	Odour, from deceased animals		Deceased animals are removed from pens daily	Low level off-site impacts to amenity <b>Minor</b>	Could occur at some time <b>Possible</b>	<b>Medium</b> Acceptable, subject to regulatory controls	Mortalities in the deep litter shelters are managed in the same manner as the conventional sheds (refer to above), which appears to be acceptable.	Refer above

<sup>6</sup> The Eucalypt Woodlands are listed as a critically endangered Threatened Ecological Community (TEC) under the *Environment Protection and Biodiversity Conservation Act 2016 (Cth)*, and a Priority Ecological Community (PEC, P3) under the *Biodiversity Conservation Act 2016 (WA)*

Risk Event				Consequence rating <sup>1</sup>	Likelihood rating <sup>1</sup>	Risk <sup>1</sup>	Reasoning	Regulatory controls
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
	Noise and dust, from animals and machinery movements		None specified	Low level off-site impacts to amenity <b>Minor</b>	Likely to occur only in exceptional circumstances <b>Rare</b>	<b>Low</b> Acceptable, not subject to controls	Noise and dust from operation of the deep litter shelters is not expected to differ significantly from the conventional sheds (refer to above), which appears to be acceptable.	None specified
<b>Category 2: Solid waste management and storage</b>								
Desludging anaerobic pond	Odour, from the regular (annual) disturbing and handling of pond solids	Unreasonable interference with the health, welfare, convenience, comfort and amenity of nearby sensitive receptors (5 within 5 km radius)	None specified	Low level off-site impacts to amenity <b>Minor</b>	Could occur at some time <b>Possible</b>	<b>Medium</b> Acceptable, subject to regulatory controls	Annual desludging of the anaerobic pond is required to minimise the buildup of sediment and odour issues, thereby maintaining the efficiency and effectiveness of the wastewater treatment process. However, the more frequent disturbing and handling of pond solids increases the frequency of odour events during desludging activities, if not managed carefully.  The delegated officer considers the risk of relatively short-term odour impacts that may arise as part of regular maintenance of the anaerobic ponds (to manage sludge levels) will result in a better outcome for off-site receptors than ongoing nuisance odour that may result from poorly maintained ponds.  Providing that desludging activities are conducted in a manner consistent with the NEGIP, the ongoing risk of odour impacts appears to be acceptable.	- Odour management in accordance with the NEGIP
Transfer of spent bedding from deep litter shelters Stockpiling of spent bedding Processing of mortalities	Nutrient-laden leachate from spent bedding, mobilised by surface water runoff	Runoff causing impacts to health of immediately adjacent native vegetation (critically endangered TEC <sup>7</sup> ) Seepage/infiltration, causing contamination of shallow groundwater	Stockpiling spent bedding on manure hardstand pad with runoff containment in place Some spent bedding is used in processing mortalities	Short-term impact to an area of high conservation value <b>Major</b>	Likely to occur only in exceptional circumstances <b>Rare</b>	<b>Medium</b> Acceptable, subject to regulatory controls	Spent bedding removed from the deep litter shelters is stockpiled on a bunded hardstand pad, which has only recently been constructed. Previously, spent bedding was stockpiled on the bare ground, or in paddocks, pending spreading.  The applicant advises the hardstand pad is clay lined; however, it is unclear to what standard it has been constructed (depth of clay, compaction, permeability, etc.). The applicant also advises the pad has been sufficiently sized to store the amount of spent bedding and mortalities generated from the expansion proposal.  A runoff collection pond has been constructed at the lowest point of the pad, to contain surface runoff and leachate from the stockpiles. The pond has been sufficiently sized to contain the volume of runoff generated from the catchment area, to ensure the frequency of spill events are less than an average of one in 20 years.  Providing that spent bedding and mortalities are stored and processed, respectively, on the hardstand pad and according to NEGIP recommendations, the ongoing risk of impacts appears to be acceptable.	- Infrastructure design and operational requirements specified in infrastructure table - Must be maintained to ensure integrity is sustained
	Odour, from stockpiles	Unreasonable interference with the health, welfare, convenience, comfort and amenity of nearby sensitive receptors (5 within 5 km radius)	Spent bedding stockpiled in large windrows Mortalities processed in large bays (separate to bedding)	Low level off-site impacts to amenity <b>Minor</b>	Could occur at some time <b>Possible</b>	<b>Medium</b> Acceptable, subject to regulatory controls	The NEGIP recommends fixed separation distances of at least 250 m to rural dwellings and 750 m to a townsite. The closest rural dwelling is about 1.5 km northwest of the conventional sheds and two others within a 5 radius. The nearest small town of Ongerup is about 13 km to the north.  There is no recorded history of nuisance odour complaints according to the Shire of Cuballing from historical operations at this site, likely due mainly to there being few sensitive receptors in proximity.  Providing that spent bedding and mortalities are stored and processed, respectively, on the hardstand pad and according to NEGIP recommendations, the ongoing risk of impacts appears to be acceptable.	- Stockpile management specified, in accordance with the NEGIP

<sup>7</sup> The Eucalypt Woodlands are listed as a critically endangered Threatened Ecological Community (TEC) under the *Environment Protection and Biodiversity Conservation Act 2016 (Cth)*, and a Priority Ecological Community (PEC, P3) under the *Biodiversity Conservation Act 2016 (WA)*



Risk Event				Consequence rating <sup>1</sup>	Likelihood rating <sup>1</sup>	Risk <sup>1</sup>	Reasoning	Regulatory controls
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
<b>Category 2: Solid waste utilisation</b>								
Irrigation of effluent, followed by spreading of processed mortalities, over 175 ha of dryland cropping land	Leaching or runoff of nutrients from irrigated or spread waste	Runoff to nearby surface water features (Hotham River South) and other drains, causing surface water contamination Contamination of soil, causing contamination of shallow groundwater Soil acidification Excessive build-up of soil P	Effluent and processed mortalities is evenly irrigated/spread at a consistent application rate (based on crop requirements), low pressure to avoid runoff Buffer of 25 m to waterlines, 50 m to premises boundary	Mid-level on-site impacts <b>Moderate</b>	Could occur at some time <b>Possible</b>	<b>Medium</b> Acceptable, subject to regulatory controls	The delegated officer has considered advice provided by DPIRD on the applicant's proposal to irrigate effluent and spread processed mortalities on the premises and has determined the yearly application rate of 30.8 m <sup>3</sup> /ha (3.1 mm/yr) effluent and 1.5 t/ha processed mortalities over 175 ha of cropping land is an acceptable method to maintain the soil's capacity to absorb nutrients and to limit water repellence. At these application rates, it is achievable that 100% of the effluent and mortalities generated by activities can be managed on-site, with the uptake of applied nutrients removed as part of the proposed cropping rotation.  As the proposed controls are critical for maintaining an acceptable level of risk, they will be imposed on the licence as ongoing operational controls.  In addition, the delegated officer considers the suggestion by DPIRD for soil testing before and after the application of manure has merit, to allow the ability to track movement of P and other nutrients down the soil profile and indicate if there is leaching at greater depth.  Additional controls are also required to ensure there are sufficient setbacks to surface water features on the premises, to minimise the risk of runoff entering these systems.	- Effluent utilisation areas delineated on licence; - Maximum application rates specified; - Spreading requirements specified; - Annual soil sampling requirements
	Odour, from irrigated effluent and spread waste	Unreasonable interference with the health, welfare, convenience, comfort and amenity of nearby sensitive receptors (3 within 5 km radius)	Not spreading within 25 m of premises boundary Timing of spreading during optimal weather conditions	Low level off-site impacts to amenity <b>Minor</b>	Could occur at some time <b>Possible</b>	<b>Medium</b> Acceptable, subject to regulatory controls	There are 2 receptors and the Yornaning townsite within proximity to the paddocks where waste is spread, therefore careful management and timing of effluent irrigation and solid waste spreading is required to minimise off-site amenity impacts.  The NEGIP provide detailed recommendations on the optimal times and conditions for solid waste spreading, such as not irrigating/spreading if heavy rain is expected or has fallen over the past 48 hours, only during conditions that maximise odour dispersion, etc.	- Must only spread during optimal weather conditions, as per the NEGIP
Spreading of pond sludge and/or spent bedding over 66 ha of dryland cropping land	Leaching or runoff of nutrients from spread waste	Runoff to nearby surface water features (Hotham River South) and other drains, causing surface water contamination Contamination of soil, causing contamination of shallow groundwater Soil acidification Excessive build-up of soil P	Pond sludge and/or spent bedding is evenly spread at a consistent application rate (based on crop requirements), to avoid runoff Buffer of 25 m to waterlines, 50 m to premises boundary	Mid-level on-site impacts <b>Moderate</b>	Could occur at some time <b>Possible</b>	<b>Medium</b> Acceptable, subject to regulatory controls	The application indicates either pond sludge or spent bedding could be used on the remaining 66 ha of land available for spreading (that has not been allocated for effluent irrigation). However, the nutrient calculations in the application have been based on spreading spent bedding over 175 ha every 3 years (471 ha annually) and spreading sludge over 170–210 ha every 4-5 years (830 ha annually) – it is therefore unclear what the offtake strategy is being proposed, as there is insufficient land available to spread at the proposed rates.  The proposal to spread at 4-5 times the calculated rates for nitrogen and phosphorus once every 4-5 years is also problematic, with the expectation that applied nutrients will simply remain stored in the soil and wait to be used each year. This proposal will need to be supported by a detailed nutrient management plan (NMP) that clearly outlines the application rates for each waste type for each soil type and shows how the crop rotation program will ensure optimal removal of nutrients.  The applicant has proposed spreading rates (1.1 t/ha/yr of spent bedding or 0.65 m <sup>3</sup> /ha/yr of pond sludge), up to 14% of the available spent bedding or 8% of the available pond sludge generated by the piggery operations each year could be spread over the 66 ha available (or a combination of the two), with the remainder to be directly removed off-site.  At appropriate rates, all soil-landscape units on the premises are suitable for spreading solid waste, however, the appropriate rates for this premises have not been established and the data available suggests that in this fragile environment the rate will be low. In the absence of a detailed NMP, the delegated officer has determined to restrict spreading of spent bedding and pond sludge at the lowest rate of 10 kg/ha/yr until soil testing is available to scientifically	- Solid waste utilisation areas delineated on licence; - Maximum application rates specified – conservative rates in absence of detailed NMP; - Spreading requirements specified; - Annual soil sampling requirements - Excess solid waste must be removed from site

Risk Event				Consequence rating <sup>1</sup>	Likelihood rating <sup>1</sup>	Risk <sup>1</sup>	Reasoning	Regulatory controls
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
							determine the appropriate rate. These controls will be added to the licence as they are considered critical for maintaining an acceptable level of risk. Ongoing sampling and testing results would confirm whether the current nutrient management system is operating in a sustainable manner and the utilisation areas have the capacity to assimilate the proposed increased nutrient application without causing environmental degradation.	
	Odour, from spread waste	Unreasonable interference with the health, welfare, convenience, comfort and amenity of nearby sensitive receptors (3 within 5 km radius)	Not spreading within 25 m of premises boundary Timing of spreading during optimal weather conditions	Low level off-site impacts to amenity <b>Minor</b>	Could occur at some time <b>Possible</b>	<b>Medium</b> Acceptable, subject to regulatory controls	There are 4 rural dwellings and the Yornaning townsite within proximity to the paddocks where waste is spread, therefore careful management and timing of solid waste spreading is required to minimise off-site amenity impacts. The NEGIP provide detailed recommendations on the optimal times and conditions for solid waste spreading, such as not spreading if heavy rain is expected or has fallen over the past 48 hours, spreading during conditions that maximise odour dispersion, incorporating spread manure into the soil as soon as practicable after application, etc.	- Must only spread during optimal weather conditions, as per the NEGIP

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Guideline: Risk Assessments (DWER 2020).

## 7. Decision

### Existing piggery operations

The delegated officer has determined that ongoing operation of an intensive piggery complex on the premises, with an assessed design capacity of 2,170 SPUs, may pose an unacceptable risk of impacts to public health and the environment due to the following aspects being assessed as inconsistent with the NEGIP:

- spent bedding from the deep litter shelters historically being directly stockpiled in paddocks (instead of a hardstand pad), prior to spreading;
- pond sludge removed from the anaerobic pond historically being stockpiled directly in paddocks (instead of being allowed to dry on a hardstand pad), prior to spreading;
- it being unclear whether historical spreading of processed mortalities, spent bedding and pond sludge has been applied sustainably, i.e., in accordance with a nutrient mass balance to determine appropriate spreading rates for each nutrient (using on-farm sampling and testing results) and in a manner that protects the environment;
- the design and construction standard of the existing wastewater treatment infrastructure is unclear, including the pond wall raise in 2019, due to the lack of materials testing and construction certification details; and
- confirmation the deep litter shelters are not washed out following the removal of spent bedding, in addition to the absence of infrastructure for containing wash water, should a shelter need to be washed out.

The applicant was provided an opportunity to address these aspects, prior the delegated officer making a final determination on the application, which resulted in additional controls being imposed on the licence.

The remaining aspects of the operation, such as the siting, design and day-to-day management of the piggery has been assessed as being consistent with the NEGIP and do not pose an unacceptable risk of impacts to public health and the environment. This is based on the following:

- being located in a climate with high annual moisture deficit, which lowers the overall risk of environmental impacts commonly associated with wet conditions;
- the piggery complex being located on priority agricultural land and well separated from populated areas and nearby (human) sensitive receptors;
- both the conventional and deep litter sheds comprise a concrete hardstand base;
- the effluent ponds having sufficient storage capacity so that they spill no more frequently than an average of one in 20 years;
- mortalities being processed on a dedicated hardstand pad with runoff containment in place; and
- there being no recorded complaints by the Shire of Cuballing or the department in the past 5 years.

Key risks from ongoing operations of this piggery largely relate to the management of solid and liquid wastes, i.e., the application of pond effluent, pond sludge and spent bedding over paddocks on the premises. Controls have been added to the licence to require careful review of current management, including regular monitoring, to ensure that nutrient runoff and leakage, and other forms of land degradation do not, and are not, occurring.

### Proposed piggery expansion

The delegated officer has determined the proposed expansion to an assessed design capacity of 4,893 SPUs poses a high risk of impacts to surface water and groundwater, native vegetation and other forms of land degradation. This determination is based on there being insufficient land to sustainably manage the amount of nutrients within pond sludge and spent bedding that will be generated at the proposed capacity, and with the proposed 4-5 yearly

offtake strategy.

Most of the spent bedding and pond sludge generated from the expanded operations will need to be taken off-site for further processing or reuse, which as a raw (unprocessed) waste, will need to be accepted by a premises that is lawfully able to accept that kind of waste, such as a licensed composting facility or a solid waste facility – it must not be simply given away for spreading on other farms in raw (unprocessed) form.

An alternative option is for the spent bedding and dried pond sludge to be processed to significantly reduce the number of pathogens, where approvals are not required for off-site reuse or sale if the material has been properly processed (pasteurised) and meets specified quality standards for indicator pathogens and plant propagules.

The remaining aspects of the proposed expansion, such as the siting, design and day-to-day management of the expanded piggery, have been assessed as being consistent with the NEGIP and do not pose an unacceptable risk of impacts to public health or the environment. This is based on the following:

- the proposed design and construction standard of the new conventional sheds, effluent ponds and deep litter shelters being consistent with the NEGIP;
- the capacity of the new effluent ponds being sufficiently sized so that they spill no more frequently than an average of one in 10 years;
- the capacity of the existing anaerobic pond being sufficiently sized to contain the increased volume of effluent and so that it does not spill no more frequently than an average of one in 10 years;
- the capacity of the existing manure hardstand pad being sufficiently sized for managing the expected increase in spent bedding, pond sludge and mortalities; and
- the proposal to commence irrigation of effluent, in conjunction with the spreading of processed mortalities and a 4-yearly cropping program, being an acceptable offtake strategy for managing these waste streams.

In addition, the applicant proposes to conduct soil testing within topsoil (0-10 cm) on an annual basis and subsoil (30-60 cm) on a biennial basis, for each paddock, prior to each spreading event, to provide assurance the application of effluent, processed mortalities and the spreading of other solid waste is acceptable and sustainable. Additional surface water monitoring is required to provide assurance the irrigation of effluent and spreading of solid waste is not impacting on the Hotham River South.

The delegated officer is satisfied the above controls and monitoring lower the overall risk profile of the premises and are critical for maintaining an acceptable level of risk of impacts during operations; as such they will be imposed on the licence as construction requirements and infrastructure controls.

Following the completion of expansion works, the applicant must submit a compliance certification report, prior to applying for an amendment to the licence to include the necessary authorisation to increase operations to 4,893 SPUs capacity.

### **Draft decision and applicant comments**

The applicant was provided with preliminary drafts of the licence and decision report on 13 February 2023 and raised several concerns around the proposed restrictive conditions for pond desludging, effluent disposal, and solid waste spreading. These matters were discussed further, and changes were made to the drafts, where required.

The final drafts of the licence and report were provided to the applicant on 5 April 2023, which the applicant made no further representations.

Licence L9290/2021/1 that accompanies this report authorises emissions and discharges from ongoing operations of the existing piggery complex (2,170 SPU capacity). The conditions in the licence, as outlined in the above risk table, have been determined in accordance with the

*Guideline: Setting Conditions* (DWER 2020).

### **Amendment June 2023**

The licence was amended in June 2023 to correct an unintentional cross-referencing error between two conditions. The amendment was completed as an administrative change, which did not alter the obligations of the licence holder.

## **8. Conclusion**

Based on this assessment, it has been determined a licence will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

In accordance with the *Guidance Statement: Licence duration* (DER 2016), the duration of the licence will be 20 years.

## **References**

1. Animal Welfare Working Group (AWWG) 2008, *Model Code of Practice for the Welfare of Animals: Pigs*, Primary Industries Ministerial Council, CSIRO Publishing.
2. Australian Pork Ltd 2018, *National Environmental Guidelines for Indoor Piggeries* (NEGIP).
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. DER 2016, *Guidance Statement: Licence duration*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2019, *Guideline: Industry Regulation Guide to Licensing*, Perth, Western Australia.
6. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.

## Appendix A

### Design capacity

The total design capacity of the proposed expansion is summarised in the below table, based on the minimum floor area (m<sup>2</sup> per pig) allowed by current animal welfare standards (AWWG 2008).

#### Proposed expansion – design capacity

Name	Housing type	Dimensions	Pig class	Design capacity	
				Pigs	SPUs
Farrowing shed	Conventional	10 x 30 m	Lactating sow	54	135
<b>New Farrowing shed</b>				54	135
Dry Sow Shed 1			Dry sow	200	320
Dry Sow Shed 2		9 x 22 m		132	211.2
<b>New Dry Sow Shed 3</b>		10 x 30 m		200	320
<b>New Finisher Sheds (2)</b>		9 x 30 m	Finisher	818	1,308.8
<i>Total conventional:</i>				<b>1,458</b>	<b>2,429.2</b>
Dry Sow Shelter	Deep litter	9 x 22 m	Dry sow	132	211.2
<b>New Dry Sow Shelter</b>		9 x 30 m		180	288
Weaner shelters (3)		7 x 12 m	Weaner	746	373
<b>New weaner shelters (3)</b>		7 x 12 m		746	373
Small grower shelters (5)		9 x 22 m	Grower/ finisher	1,410	1,410
Large grower shelters (2)		9 x 30 m		629	1,007
<b>New grower shelters (5)</b>		9 x 30 m		1,573	2,517
<i>Total deep litter:</i>				<b>5,416</b>	<b>6,179.2</b>
<b>Total:</b>				<b>6,874</b>	<b>8,608.4</b>