



Application for Licence

Division 3, Part V *Environmental Protection Act 1986*

Licence Number	L9186/2018/1
Licence Holder	Mark Furphy
File Number	DER2018/001639
Premises	Adelong Farm Piggery 290 Gaths Road COMMODINE WA 6311 Legal Description - Lot 9081 on Plan 135464 Part William Location 9081 and Lots 20, 21, 22, 3570, 3697, 4205, 8788, 9579, 10418, 10424, 11540, 12165, 12932 and 14896 As defined by the coordinates in Schedule 1 of the Licence
Date of Report	25 June 2019
Status of Report	Final

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1. Definitions of terms and acronyms

In this Decision Report, the terms in Table 1 have the meanings defined.

Table 1: Definitions

Term	Definition
Annual Period	means a 12 month period commencing from 27 June to 26 June in the following year
ARI	means the average recurrence interval or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration
Bulking material	Refers to material suitable for covering of pig carcasses and can include but is not limited to spent bedding, sand, clay, straw and sawdust
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 JOONDALUP DC WA 6919 info@dwer.wa.gov.au
Compliance Report	means a report in a format approved by the CEO as presented by the Licence Holder or as specified by the CEO (guidelines and templates may be available on the Department's website).
Decision Report	refers to this document
Delegated Officer	an Officer delegated under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
Hydraulic Conductivity	describes the ease with which a fluid (usually water) can move through the pore spaces or fractures. It depends upon the intrinsic permeability of the material and the density and viscosity of the fluid. Hydraulic conductivity is expressed in metres per second (m/s)
Issued Licence	this Licence L9186/2018/1 issued under Part V, Division 3 of the EP Act
m ³	cubic metres
Licence Holder	refers to the occupier of the premises being the person to whom this Licence has been granted, as specified at the front of this Licence
Minister	the Minister responsible for the EP Act and associated regulations
NEGIP	refers to the <i>National Environmental Guidelines for Indoor Piggeries</i> , Australian Pork Limited, 2018
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997 (WA)</i>
Passageways	refers to areas where pigs are herded between piggery sheds or from transport areas where pigs are either unloaded or loaded onto trucks
Prescribed Premises	has the same meaning given to that term under the EP Act
Premises	refers to the premises to which this Decision Report applies, as specified at

	the front of this Decision Report
Primary Activities	as defined in Schedule 2 of the Revised Licence
Reuse Areas	refers to land where manure are beneficially used as inputs to a cropping system. For the purposes of this Licence, Reuse Areas refer to the Lots highlighted in red in Schedule 1: Maps, Map 1: Premises boundary of the Licence
Risk Event	As described in <i>Guidance Statement: Risk Assessment</i>
SPU	standard pig unit
TDS	refers to total dissolved salts and is used to measure the salinity of fresh water, typically in mg/L
the Works Approval	Works Approval W6118/2017/1 assessed for works associated with an increase in production capacity to 7,000 SPU

2. Purpose and scope of assessment

Mark Furphy (the Licence Holder) has operated Adelong Farm intensive piggery since 1998. Expansion works to expand the piggery from 5,000 to 7,000 Standard Pig Units (SPU) was undertaken in 2017 ahead a works approval for the works being granted. This increase resulted in the construction of eight new deep litter piggery sheds.

On completion of the expansion works, the Delegated Officer determined that the Adelong Farm piggery was now a prescribed premises and thus required a license in accordance with Schedule 1 of the EP Regulations: Category 2 intensive piggery: premises on which pigs are fed, watered and housed in pens

The Licence Holder submitted a licence application (the Application) to operate the piggery on 29 November 2018. This Decision Report contains an assessment of the emissions and discharges associated with the operational phase of the expanded piggery. As part of this assessment process, the Department's Guidance Statements (as noted in Appendix 1) were considered when proposing regulatory controls for the emissions and discharges associated with entire piggery operation.

The key factors considered in this assessment include:

- The overall emissions and discharges likely to be emitted from the premises, such as: odour, mortalities, spent bedding, composting activities, stormwater runoff, leachate and the application of composted wastes to land;
- Information obtained through a site visit to the premises on 18 March 2019;
- The Application which included the application form and supporting documentation; and
- The recommended operational practices as detailed within the NEGIP.

2.1 Application details

Table 2 lists the Application documents and supporting information submitted during the assessment process.

Table 2: Application documents and supporting information

Document / information description	Date received	DWER document reference
Email from M & B Furphy, Subject: application for a Licence form, attach additional information and signed Application for a Licence form	11/12/2018	A1746601
Email from M & B Furphy, Subject: application for a Licence form, attach map of site infrastructure	29/11/2018	A1743998
Email from M & B Furphy, Subject: application for a Licence form, include response to draft Works Approval Application	07/09/2018	A1722652
Works Approval Application and supporting information	13/12/2017	A1605386

3. Background

The Licence Holder operates a mixed farming enterprise on land totaling 1,158 hectares at 290 Gaths Road, Cuballing in the Shire of Cuballing. The intensive piggery operations occupy approximately 10 hectares of the farm and the predominant farming activities include grazing sheep and cereal cropping.

The piggery is located on Lot 9081 and is situated in a sparsely populated area in the wheat belt region of Western Australian. The nearest population centers are over 15km away from the

premises and include the towns of Cuballing, Popanyinning and Wickipen. Lot 9081 is bounded by other paddocks owned by the Licence Holder and used for cereal cropping. There is a dam belonging to a neighboring farm located to the immediate south of the piggery.

There are no mains electricity or water connected to the site. Petrol generators are used to generate electricity at the farm. Water is sourced from a combination of rainfall which is collected in surface dams, and bores which access the underlying groundwater. Feed for the animals is sourced off site and stored in a grain storage facility on the farm.

The piggery is a prescribed premises, as detailed in Table 3.

Table 3: Prescribed Premises Categories in the Issued Licence

Classification of Premises	Description	Approved Premises production or design capacity or throughput
Category 2	Intensive piggery: premises on which pigs are fed, watered and housed in sheds	5,000 animals (7,000 SPU)

4. Overview of Premises

4.1 Operational aspects

Adelong Farm is a grower and finisher piggery where piglets at 10 weeks of age are purchased, brought onto the premises and raised until approximately 24 to 30 weeks of age (90kg) at which time they are consigned to market. Approximately 270 pigs are accepted on the farm and consigned to market each week maintaining relatively stable animal numbers on site throughout the year (M. Furphy personal. communication, 18 March 2019). Pigs are housed according to their age range and pig class and the equivalent number of animals in SPU are detailed in Table 4.

Table 4: Pig Classes, numbers and SPU of animals

Pig class	Age Range (weeks)	SPU Factor	Number of pigs	Total SPU
Growers	10 - 15	1.0	2,000	2,000
Finishers	16 – 22	1.6	2,000	3,200
Heavy finishers	22 - 30	1.8	1,000	1,800
Total			5,000	7,000

Note: Pig classes and SPU conversion factors from Works Approval (W6118/2017/1) Application. The SPU Factor is detailed in Table 4.1, Section 1 of the NEGIP

4.2 Deep litter sheds

According to the NEGIP, a deep litter piggery is where pigs are accommodated in shelters typically made from hooped metal frames, covered with a water proof fabric and located on a concrete floor. Straw is used as bedding material which is used to cover the floors and the bedding (spent bedding) is replaced on a needs-be basis or when the pigs are moved from that shed.

At Adelong Farm, the animals are housed in 26 deep-litter rectangular sheds of various dimensions depending on the age of the animals (as specified in Table 7). Each shed includes a concrete floor, concrete bunker walls (approximately 1m high) and a domed shelter on the top. The elongated side of the sheds are positioned in an east west alignment with earthen bunding along the outside of the shed to direct stormwater flow away from the sheds.

Hay bales are placed on the western side of each shed to provide some shelter from prevailing winds and rain during times of extreme weather, or when extra shelter from the weather is deemed desirable (M. Furphy, personal. communication, 18 March 2019). The western and

eastern side of the sheds contain fencing which is easily removed to allow cleaning of the sheds and movement of the animals between sheds.

The sheds rely on natural airflow for cooling during the hot summer months, and the east west alignment allows for the morning easterly and afternoon westerly winds to tunnel through the sheds. Irrigation piping, raised above ground level and traversing the side walls of the sheds, provides a secondary cooling system for this pigs. Water is allowed to flow from approximately four water outlets in the piping per shed and the flow of water is controlled by the Piggery Manager. The Licence Holder is considering changing this system from a steady stream pipe to misting sprinklers. Drinking troughs and automatic feeding troughs are located at opposite ends of each shed.

The pigs are maintained in the same age/size group throughout their time at the facility with each group being rotated through-out the sheds as they grow. On average, a pig group is moved every 4-6 weeks. This allows pigs of the same age / size grouping to be maintained in the same shed, and for sequential sizing and ages of the pigs throughout the facility. The movement also allows for regular and sequential cleaning of the sheds, starting from the sheds of mature pigs as they are sent to market.

Oat and barley straw, sourced from cereal cropping activities on the farm, are used as both bedding for the animals and a deep litter absorbent for the shed floors to absorb manure, urine, spilt water and food. During the 4 – 6 week period when the pigs are accommodated within a particular shed, the spent bedding is regularly topped up or changed. The process for managing spent bedding changes depends on the weather as it is a balance between keeping the pigs wet and cool, and keeping 75% of the bedding dry as required by the NEGIP.

4.3 Piggery waste management

The main type of wastes generated at the piggery include carcasses, spent bedding/manure and contaminated stormwater runoff. The shed floors are not washed following the removal of the spent bedding between batches of pigs. Hence, wastewater is not generated during operations.

4.3.1 Spent Bedding Storage Pad

Prior to a new pig group being moved to one of the sheds, the floors are mechanically cleaned and the majority of the spent bedding is transferred to the Spent Bedding Storage Pad and a smaller portion is used to cover carcasses in the Carcass Storage Pile (refer Figure 4). Spent bedding is a moist solid containing the bedding material, manure (faeces and urine) and spilt water and food. The manure portion will include:

- organic matter consisting of complex carbohydrates;
- nutrients including nitrogen, phosphorus and potassium and a range of minor nutrients and trace elements;
- salts which are contained in the feed; and
- micro-organisms including pathogens.

Additions to the Spent Bedding Storage Pad are progressive, moving from north to south and the spent bedding is allowed to decompose for a period of 6 to 12 months prior to being mixed with wastes from the Carcass Storage Pile and applied to land (refer section 4.3.3).

4.3.2 Carcass Storage Pile

The mortality rate at the premises is approximately 3% per batch of pigs or approximately 150 per annum, based on a throughput of 7,000 SPU. The carcasses are transported to the Carcass Storage Pile on the same day they are identified (refer to Figure 4) and covered with spent bedding, which prevents exposure to vectors, acts as a carbon source for the micro-organisms

and aids in the decomposition process.

Additions to the Carcass Storage Pile are progressive, moving from south to north, and the pile is turned approximately once every 6 months. Allowing for the breakdown of carcasses, decomposition of the Carcass Storage Pile takes several months to occur and it is allowed to decompose from 6 to 12 months prior being mixed with wastes from the Spent Bedding Storage Pad and applied to land (refer 4.3.3).

4.3.3 Application of solid wastes to Reuse Areas

Following decomposition of the spent bedding and carcasses, these solid waste piles are mixed prior to spreading on the surrounding paddocks in February and March as a partial fertilizer replacement. The Reuse Areas are shown in refer Figure 7 and the solid waste is distributed using a muck spreader and allowed to sit on the surface where it continues to further decompose until autumn when seeding occurs.

According to the APL 2015, the application of spent bedding and decomposed carcasses is a suitable disposal method which can improve soil structure, build soil organic matter levels, improve rainfall infiltration and soil water holding capacity, enhance soil fertility, reduce erosivity, increase plant yields and reduce inorganic fertiliser costs. However, poor practices can lead to a range of environmental concerns including nutrient overload, contaminated nutrient rich runoff and amenity issues such as odour emissions.

APL 2015 provides an estimate of the nutrient removal range for barley and seed oats, which are the crops grown on the Licence Holder's surrounding land (refer Table 5). It should be noted that the pig's diet is often supplemented with phosphorus to encourage healthy growth with farmers tending to over supplement phosphorus in the diet. Hence, excess phosphorus not absorbed by the animal becomes part of the manure waste stream (Joern and Sutton, 2010).

Land application rate for solid wastes

In order to determine appropriate application rates, APL 2015 recommend that nutrient budgeting is essential for sustainable reuse and application rates need to consider:

- The nutrient status of soils,
- The nutrient (N, P and K) content of the manure added to the land;
- Nutrient removal through crop harvest; and
- Management of salt to prevent soil degradation and damage to crops.

The Delegated Officer has carried out a calculation, based on the crops grown on Adelong Farm (oats and barley straw) using the average removal rates, as detailed in Table 5.

Table 5: Approximate nutrient removal rates for crops and crop yields¹

Crop	DM Nutrient content (kg/t) ^a			Yield range (DM t/ha) ^{b,c}	Nutrient Removal range (kg/ha)		
	N	P	K		N	P	K
Barley straw	19	3	4	2-5	38-95	6-15	8-20
Oats	15	3	4	1-5	15-75	3-15	4-20

a 1 kg/t is equivalent to 1 g/kg, 1000 mg/kg or 1000 ppm. Data in the dry matter nutrient content column (kg/ha) can be used to calculate approximate nutrient removal rates by multiplying by an appropriate dry matter yield (t/ha) for a given location.

b Yields may vary from these ranges (refer to historical data for the region for more accurate estimates).

c DM t/ha is Dry matter expressed as tonnes / hectare

Note 1: Delegated Officer calculations based on Chapter 8 and Table 11 of *Piggery Manure and Effluent Management and Reuse Guidelines (APL) 2015*

Based on Table 5, spreading spent bedding on land used to grow oats and barley straw will yield an average of 3.5 DM tonnes/ha (yield range using mid-range nutrient content). The

application rate for phosphorus is seen as the limiting nutrient for Australian soils. Based on Table 5, the expected removal rate for phosphorus will be **10.5kg/ha** (3.5tonnes/ha x 3kg/tonnes (yield range x DM nutrient content)).

Manure spreading rates are generally expressed as tonnes/hectare. Because manure can add a large quantity of nutrients in one application, no allowance is made for P storage in the soil, which is. APL 2015 recommends the following formula be applied to determine application rates:

Nutrient application rate = nutrient removed by plant harvest + acceptable nutrient losses to the environment

$$\begin{aligned}
 \text{P application rate (kg/ha)} &= 10.5\text{kg/ha} + 0 \text{ kg/ha/year of acceptable losses} \\
 &= \mathbf{10.5\text{kg P application rate per hectare}}
 \end{aligned}$$

Table 6 shows the typical nutrient content of spent bedding from deep litter piggeries where the nutrient content differs according to the type of bedding used.

Table 6: Nutrient content of spent bedding from deep litter piggeries

Unit		Straw	Rice Hulls	Sawdust
Moisture	% wb	41.6 (18 - 64)	36 (21 - 53)	40.8 (21 - 50)
pH		6.8 (5.7 - 8.5)	7.1 (7 - 7.3)	6.3 (6.2 - 6.3)
Total nitrogen or (TKN)	% db	0.8 (0.2 - 1.3)	0.7 (0.1 - 1.6)	0.9 (0.6 - 1.3)
Ammonium nitrogen	% db	0.5 (0 - 1.2)	0.3 (0.1 - 0.5)	0.6 (0.4 - 1)
Total phosphorus	% db	1.1 (0.2 - 2.5)	0.9 (0.6 - 1.3)	1 (0.4 - 1.3)
Ortho-phosphorus	% db	0.4 (0.2 - 0.6)	0.4 (0.3 - 0.6)	0.4 (0.2 - 0.5)
Potassium	% db	1.8 (0.6 - 2.8)	1.8 (1.2 - 2.1)	1.8 (1.6 - 1.9)
Sulphur	% db	0.4 (0.1 - 0.7)	0.4 (0.3 - 0.5)	0.5 (0.4 - 0.5)
Copper	% db	0 (0 - 0.1)	0 (0 - 0)	0 (0 - 0)
Iron	% db	1.3 (0.1 - 3.2)	1 (0.7 - 1.6)	1.1 (0.5 - 1.6)
Manganese	% db	0.1 (0 - 0.8)	0.2 (0 - 0.8)	0.3 (0 - 0.8)
Zinc	% db	0.2 (0 - 0.4)	0.1 (0 - 0.3)	0.1 (0.1 - 0.2)
Calcium	% db	1.9 (0.4 - 3.1)	1.4 (1 - 2.1)	2.4 (2.1 - 2.7)
Magnesium	% db	0.7 (0 - 1.8)	0.4 (0 - 0.6)	0.4 (0 - 0.7)
Sodium	% db	0.4 (0.1 - 0.7)	0.3 (0.1 - 0.4)	0.4 (0.4 - 0.5)
Chloride	% db	0.8 (0.3 - 1.3)	0.6 (0.4 - 0.8)	0.7 (0.4 - 1.1)
Conductivity	ds/m	11.7 (6.6 - 15.6)	9.6 (9.2 - 10)	13 (12.6 - 13.4)

Notes:
 wb = wet basis or percentage of the total weight of the spent bedding
 db = dry basis or percentage of the dry matter content of the spent bedding
 Data provided as average and range (in brackets).
 Nutrient contents based on a combination of fresh, stockpiled and composted spent bedding
 Source: Black (2000); and Nicholas et al. (2006).

Source: Table 12.3 the NEGIP

According to Table 6, total phosphorus for straw bedding will be approximately 1.1% as a percentage of the dry matter content of spent bedding, which can be expressed as 11kg P/t. APL 2015 recommend the target nutrient application rate (kg/ha) is divided by the nutrient content of the compost (kg/t). This gives the overall recommended spreading rate as **0.95 t/ha for phosphorus** (10.5kg/ha / 11 kg P/t).

According to APL 2015, the average bedding use is 0.75kg/SPU/day. It is necessary to allow for the addition of manure and spilt feed and water as well as decomposition losses of approximately 25% in the shed. This equates to 0.76m³/SPU/year of material for growers and 1.2m³/SPU/year for finishers, assuming a bulk density of 700kg/m³. Based on a throughput of 2,000 growers and 3,000 finishers for Adelong Farm, this provides approximately **5,120m³/year of spent bedding**. This is an estimate and does not include the addition of carcasses, nor does it allow for further decomposition on the Spent Bedding Storage Pad which will be greater than the 25% decomposition losses in the sheds.

Adelong Farm consists of 1,158ha of land of which approximately 10ha is occupied by the piggery. Given the presence of surface drainage lines and neighbouring boundaries, not all of the estimated 1,148ha of cleared land will be suitable for cropping and the application of solid wastes. The Delegated Officer has estimated a total of 1,100ha of land will be suitable for cropping.

Based on an estimated amount of 5,120m³ of solid waste generated each year containing 11kg P/t, this equates to 465.45 t/year of phosphorus. Spread over 1,100ha of land, this will give a spreading rate of **0.42 tonnes of Phosphorus/ha/year**. This is within the recommended spreading rate of 0.95 tonnes of Phosphorus/ha.

Key Finding: *The Delegated Officer has reviewed the information regarding the land application rate for solid wastes and has determined:*

- *The spent bedding production of 5,120m³/year has been estimated as 5,120 tonnes/year;*
- *The expected nutrient content does not include the addition of decomposed carcasses as the NEGIP does not provide the expected concentrations for a combination of spent bedding mixed with decomposed carcasses;*
- *The nutrient content noted in Table 6 shows the typical nutrient content of spent bedding from deep litter piggeries where the nutrient content differs according to the type of bedding used.*
- *Table 6 is based on straw and Adelong Farm uses a combination of oats and barley straw; and*
- *Buffers will be required between areas where solid waste is applied to land and any surrounding features such as surface water lines, areas containing native vegetation, roads and neighbouring property boundaries.*

4.3.4 Stormwater management

The pig sheds are designed to be open to the external environment while minimizing contact with incidental rainfall and surface storm-water run-off. The longitudinal side of the sheds are separated by several meters and graded to allow the flow of stormwater away from the sheds. However, incidental rainfall can enter the front eastern and rear western openings of the sheds as the concrete floors are at ground level. The rainwater can become contaminated when it mixes with the manure and straw bedding in the sheds. This runoff is allowed to flow from the sheds to the surrounding passageways, which are external to the sheds and allow the animals to be herded between the sheds. Incident stormwater can also become contaminated following contact with manure located in the passageways.

Both incident storm-water and stormwater runoff can become contaminated on contact with carcasses and spent bedding in their respective storage areas. There is the potential to form contaminated leachate runoff that may percolate to groundwater or surface water flows to nearby waterways.

4.3.5 Piggery Noise Management

The main sources of noise at the piggery are the loading and unloading of the pigs to and from the premises and movement of the pigs between sheds. This is a weekly event and short in duration. There is minimal noise emissions during feeding activities as the pigs are allowed access to the feeding troughs at all times which minimises competition. Piggery noise is managed through operating hours and separation distances to noise sensitive premises.

4.4 Infrastructure

The Adelong Farm infrastructure, as it relates to Category 2 activities, is detailed in Table 7 and referenced in the Site Plan in Figure 4.

Table 7: Adelong Farm prescribed infrastructure

#	Reference in Figure 4	Description
1.	Current sheds (18)	Dimensions vary with 4 sheds (9m x 16m), 8 sheds (9m x 22m) and 6 sheds (10m x 22m). Sheds have concrete floors and hooped canvas rooves. Approximately 250 animals are housed in each shed
2.	New sheds (8)	Dimensions are 12m x 28m. Sheds constructed under W6118/2017/1 with concrete floors and hooped metal rooves. Approximately 250 animals are housed in each shed
3.	Carcass storage piles	Mortalities placed on a pile and covered with spent bedding. The carcass pile is allowed to compost for a minimum of 6 months and up to 12 months
4.	Spent Bedding Storage Pad	Spent bedding contains manure, urine and spilt feed/water. Spent bedding is allowed to compost for a minimum of 6 months and up to 12 months
Other infrastructure		
5.	Grain storage shed	Grain for feed is brought in to the farm and stored in an enclosed shed located north of the piggery sheds prior to feeding. The grain is continuously fed through chutes into a feeding trough located in each shed to allow maximum weight gain. Any spillages is removed when the spent bedding is changed in the sheds
6.	Hospital pen	Used for sick pigs

Key Finding: *The Delegated Officer has reviewed the information regarding the application and has determined:*

The items listed under 'Other Infrastructure' in Table 7 are considered to be outside of the prescribed activities and, as such, will not be included in the risk assessment.

5. Legislative context

5.1 Other relevant approvals

5.1.1 Planning approvals

The piggery is located within the Shire of Cuballing. The Licence Holder applied for Planning Approval from the Shire to modify and increase the carrying capacity of the piggery from 3,000 to 5,000 animals. The Shire granted conditional Planning Approval and retrospective Development Approval for the piggery on 15 February 2018. The Approval included the following conditions:

- The piggery operator is required to take measures to control dust emissions on site. This includes dust from vehicular movement and from any manure stockpiles;
- The piggery operator is required to provide a Fire Management Plan for the piggery; and
- The piggery operator is required to provide a vehicle cross over for trucks entering and leaving the site.

5.2 Part V of the EP Act

5.2.1 Applicable regulations, standards and guidelines

The overarching legislation relevant to the assessment of the Application is the EP Act and its subordinate legislation. The *Environmental Protection (Noise) Regulations 1997* (EP Noise) apply to noise emissions from the Piggery.

DWER guidance statements that inform the assessment are found in Appendix 1. The Industry Regulation Fact Sheet: *Intensive Piggery* (the Fact Sheet) provides guidance on DWER's administration of licences and works approvals for intensive piggeries. Guidance within the Fact Sheet relevant to this assessment includes the following:

- DWER considers the NEGIP to represent the most appropriate industry guideline to inform its assessment; and
- In determining the production or design capacity of intensive piggeries, DWER considers the maximum number of pigs within the premises at any one time as determined using total SPU, as defined in the NEGIP.

5.2.2 Site visits

DWER Officers visited the site on 18 March 2019. During the visit, the following points were noted:

- Spent straw was stockpiled in more than one pile, and not located on the designated storage pad, as indicated in the Application;
- The Carcass Storage Pile consists of one windrow and remains in one pile for a minimum of 6 months and up to 12 months;
- The piles are turned approximately once every 6 months;
- Some carcasses were visible in the Carcass Storage Pile;
- Pipes feeding water into the sheds are gravity fed, and the Licence Holder plans to upgrade the system with separate lines for drinking water and cooling water;
- There is no lip on the concrete floor of the pig sheds, which allowed spent bedding to extrude from the sheds; and
- The surrounding soil is shallow, sandy gravel over clay. Clay is naturally occurring.

5.2.3 Clearing

The Licence Holder has not sought approval to clear native vegetation as the location of the piggery is on land that has previously been cleared for agricultural purposes.

5.2.4 Compliance History

In May 2018, DWER determined that Mr Furphy had not complied with the requirements of the EP Act, as the expansion of the premises was undertaken prior to the issue of a Works Approval. This non-compliance has been noted on DWER's Incidents and Complaints Management System (ICMS) and is currently under investigation. The Delegated Officer determined that, in the interim, Mr Furphy was required to apply for a Licence to operate the piggery and the Application was subsequently submitted on 29 November 2018.

6. Location and siting

6.1 Siting context

The piggery is located on Lot 9081, which has an area of 1,158 hectares in the Wheatbelt of Western Australia, about 200km south-east of Perth. The nearest towns are Cuballing, approximately 12.5km south west and Wickepin, which is approximately 20km in a south easterly direction. The majority of the surrounding land has been cleared for farming. The closest rural dwelling is approximately 1.8km from the piggery in a south easterly direction and the boundary of the closest dwelling is approximately 100m south of the Premises boundary (refer Figure 5).

6.2 Groundwater and surface water

Groundwater resources in the vicinity of the piggery are not proclaimed under the *Rights in Water and Irrigation Act 1914* and as such, no licence or other approval is required to take groundwater. Mr Murphy accesses groundwater from two bores on site for piggery operations, along with rainwater collected in dams. The standing water level for the production bores is approximately 70m and the salinity of the bore water is 7,000mg/L TDS and high in magnesium concentration (M. Furphy personal. communication, 18 March 2019).

Two ephemeral surface water lines run through the Premises and one of them, which is 21m north of the Spent Bedding Storage Pad, feeds into the Commitine Brook which is located 2.3km south of the Premises. The Commitine Brook flows into the Hotham River, refer Figure 7 and Table 9. The Delegated Officer noted this surface water line provides a potential pathway for contaminated stormwater runoff and leachate entering the Commitine Brook.

6.3 Soil type

The Premises consists of two types of soils, according to *Statewide Soils (2019)*. The north eastern part of the premises is undulating to hilly with some steep slopes, tors, and some lateritic mesas and buttes. The chief soils are sandy and neutral as well as acidic, yellow mottled soils, containing ironstone gravels.

The south western part of the premises is undulating terrain with ridges, spurs, and lateritic mesas and buttes. The chief soils in this area are hard, neutral and alkaline yellow mottled soils containing ironstone gravels.

The premises is relatively flat, however the norther part is situated on higher ground and the carcass composting area is situated on a relatively low lying area (refer Figure 6).

6.4 Residential and sensitive Premises

The potential for odour emissions can be managed by ensuring there is sufficient separation between a proposed piggery development and nearby residential dwellings. The Delegated Officer has used the NEGIP's *Level 1 Assessment*, which is a standard empirical formula to calculate the required separation distance to determine if there is sufficient separation between the "Activity Boundary" which is the area encompassing all odour producing activities on site and nearby residential dwellings. The distance to residential dwellings are detailed in Table 8 and Figure 5.

Table 8: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Activity Boundary	Level 1 recommended distance (m)**
Residential Premises #1 – 208 Walsh Road, Commodine	1.87km in a south easterly direction	944m
Residential Premises #2 – 81 Walsh Road, Commodine	2.18km in a southerly direction	944m
Residential Premises #3 – 361 Gaths Road, Townsendale	2.4km in a northerly direction	944m
Residential Premises #4 – 266 Fairheads Road, Commodine	2.5km in a south westerly direction	944m
Residential Premises #5 – 706 Gaths Road, Commodine	4.6km in a north easterly direction	944m
Town of Cuballing	12.5km in a south westerly direction	2,051m
Town of Wickepin	20km in a south easterly direction	2,051m

**The parameters used to calculate the Level 1 recommended distance are provided in the NEGIP, Appendix A5

6.5 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at or Emissions and Discharges from the Premises. The distances to specified ecosystems are shown in Figure 7 and below in Table 9:

Table 9: Specified ecosystems

Surface water ecosystems	Distance from the Premises
Hotham River	A major and non-perennial river and one of the major tributaries to the Murray River. Adelong Farm is located in the upper reaches of the Hotham River which is approximately 4km south west of the piggery. According to Geoscience Australia (GA 2015), a non-perennial water course means it will flow for at least a part of the year
Water courses – Surface water line	Two specified surface water lines traverse the Premises boundary and are described by Geoscience Australia (GA 2015) as minor non-perennial water courses. One is approximately 1km north of the piggery operations and unlikely to be affected by the prescribed activity within the piggery due to being within a separate part of the catchment. The second specified surface water line is 21m north of the operational activity area (specifically the Spent Bedding Storage Pad) and connects to the Commitine Brook.
Commitine Brook	A minor non-perennial watercourse which feeds into the Hotham River. It is located 2.3km south west of the Premises
East Yornaning Nature Reserve	A Crown Reserve located 6.4km east of Adelong Farm
Commodine Nature Reserve	A Crown Reserve located 3.5km south east of Adelong Farm

6.6 Meteorology

6.6.1 Regional climatic aspects

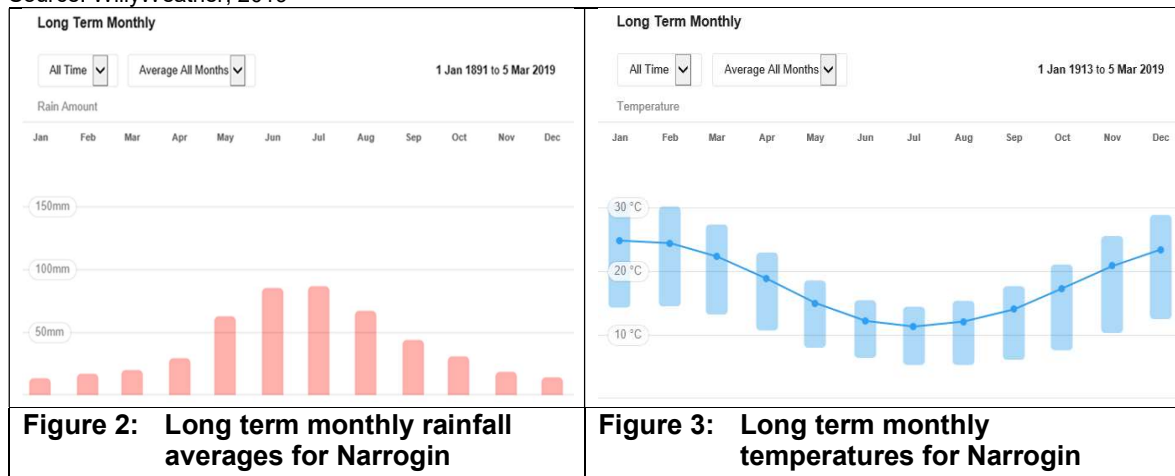
Climate statistics for Adelong Farm are illustrated in the figures below where the area experiences cool, wet winters and hot dry summers. The Wind Rose in Figure 1 is from observations taken at Cuballing, approximately 12.5km in a south westerly direction. Figure 2 and Figure 3 depict graphs for rainfall and temperatures for Narrogin which is approximately 23km south west of the piggery as Narrogin is the closest town to the piggery where long term weather observations are available.

Wind Rose



Figure 1: Five-year Wind rose for Cuballing

Source: WillyWeather, 2019



Source: WillyWeather, 2019



Figure 4: Infrastructure at Adelong Farm (DWER generated)



Figure 5: Distances from the activity boundary of the piggery (shown in yellow) and nearby Residential Dwellings (DWER generated)



Figure 6: Topographic contours surrounding prescribed activities at Adelong Farm (DWER generated)

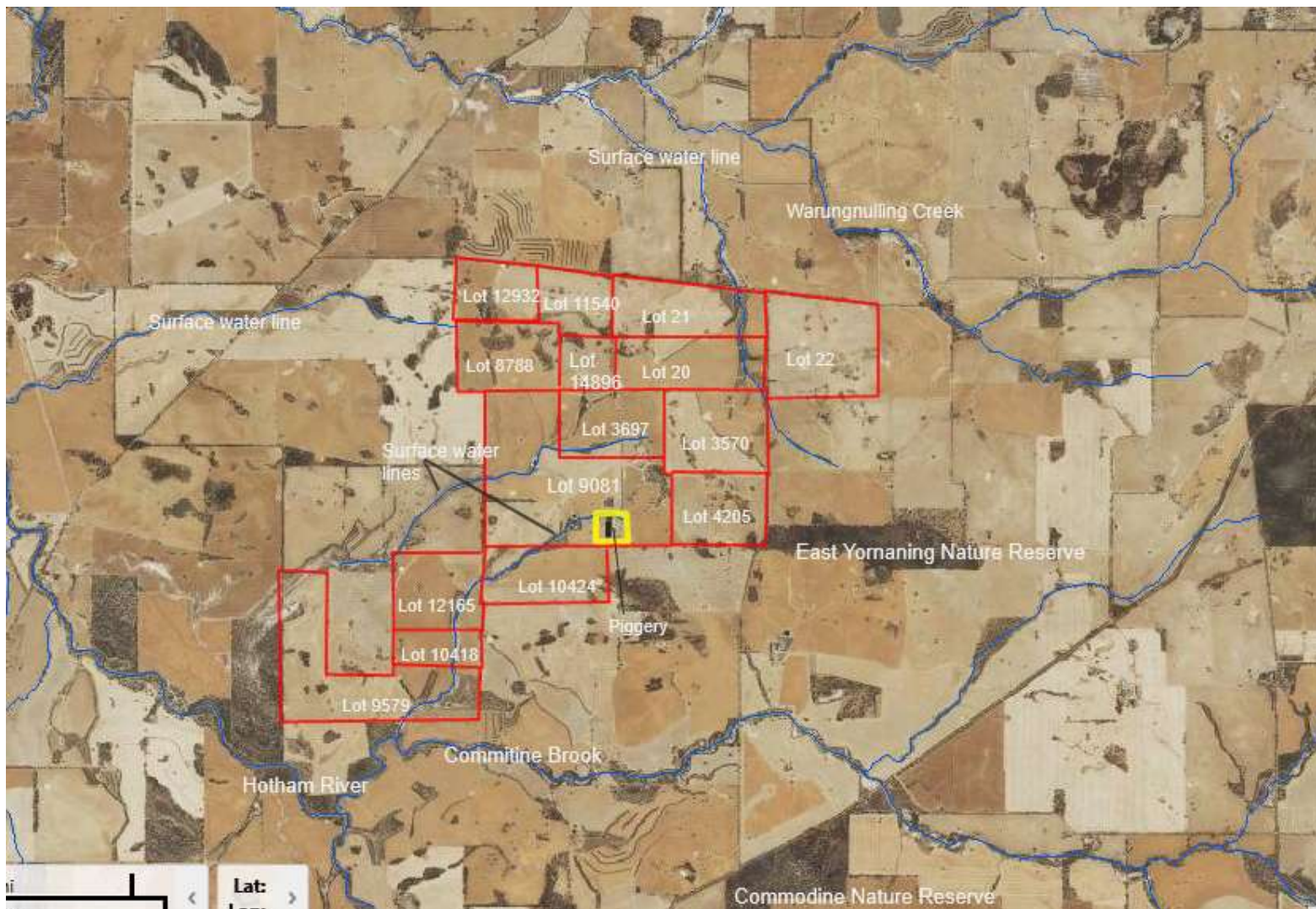


Figure 7: Reuse Areas where solid waste is applied to land are marked in red and the location of the piggery delineated in yellow (DWER generated)

7. Risk assessment

7.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emission pathways and potential receptors to establish whether there is a Risk Event which requires a detailed risk assessment. The identification of the sources, pathways and receptors to determine Risk Events are set out in Table 10 below.

Table 10: Identification of emissions, pathway and receptors during operation

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
Housing, transport and feeding of pigs	Deep letter sheds	Odour	Residential receptors - closest is 1.87 km SE	Air / wind dispersion	Amenity impacts	No	The Delegated Officer has determined that the piggery is located in an isolated rural area and nearby rural dwellings are outside of the Level 1 S-Factor recommended separation distance, as detailed in Section 6.4. No odour complaints have been received by the DWER regarding piggery operations. No further assessment required
	Stormwater flow in the vicinity of the sheds	Contaminated stormwater runoff from the piggery sheds & passageways	A nearby surface water drainage lines adjacent (within 21m) of the Spent Bedding Storage Pad drains directly to the Commitine Brook, a tributary of the Hotham River	Overland discharge	Impacts to surface water ecosystems	Yes	Refer to Section 7.4
	Feeding and truck loading / unloading of pigs	Noise emissions	Residential receptors - closest is 1.87 km SE	Air / wind dispersion	Amenity impacts	No	The Delegated Officer has determined that the separation distance between sensitive residential dwellings and the piggery is sufficient to regulate noise emissions. The <i>Environmental Protection (Noise) Regulations 1997</i> apply and no further assessment required
Collection, management and storage of solid wastes	Spent bedding cleaning from pig sheds	Odour	Residential receptors - closest is 1.87 km SE	Air / wind dispersion	Amenity impacts	No	Shed cleaning can present a high odour risk. The Delegated Officer has determined that the piggery is located in an isolated rural area. Nearby rural dwellings are outside of the calculated NEGIP Level 1 S-Factor recommended separation distance of 944m (as detailed in Section 6.4). No odour complaints have been received by the DWER regarding piggery operations. No further assessment required

Risk Events					Continue to detailed risk assessment	Reasoning	
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts			
	Spent Bedding Storage Pad	Leachate	Soil and groundwater at 70m depth	Direct discharge	Soil contamination with potential impact on beneficial use of groundwater	Yes	Refer to Section 7.4
		Odour	Residential receptors - closest is 1.87 km SE	Air / wind dispersion	Amenity impacts	No	The Delegated Officer has determined that the piggery is located in an isolated rural area and nearby rural dwellings are outside of the Level 1 S-Factor recommended separation distance. No odour complaints have been received by the DWER regarding piggery operations. No further assessment required
		Contaminated stormwater runoff	Nearby surface water line within 21m of the Pad which drains into the Commitine Brook, a tributary of the Hotham River	Direct discharge	Impacts to surface water ecosystems	Yes	Refer to Section 7.4
	Carcass Storage Piles	Leachate	Soil and groundwater at 70m depth		Soil contamination with potential impact on beneficial use of groundwater	Yes	Refer to Section 7.4
		Odour	Residential receptors - closest is 1.87 km SE	Air / wind dispersion	Amenity impacts	No	The Delegated Officer has determined that the piggery is located in an isolated rural area. Nearby rural dwellings are outside of the calculated NEGIP 2018 Level 1 S-Factor recommended separation distance of 944m (as detailed in Section 6.4). No odour complaints have been received by the DWER regarding piggery operations. No further assessment required
	Application of solid waste to land	Nutrient overload, soil degradation, contaminated stormwater runoff	Soil, groundwater and nearby surface water bodies	Direct discharge	Soil degradation and potential impact on nearby surface water bodies	Yes	Refer to Section 7.5

7.2 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 11 below.

Table 11: Risk rating matrix

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 12 below.

Table 12: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
		Environment	Public health* and amenity (such as air and water quality, noise, and odour)	
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> onsite impacts: catastrophic offsite impacts local scale: high level or above offsite impacts wider scale: mid-level or above Mid to long-term or permanent impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are significantly exceeded 	<ul style="list-style-type: none"> Loss of life Adverse health effects: high level or ongoing medical treatment Specific Consequence Criteria (for public health) are significantly exceeded Local scale impacts: permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> onsite impacts: high level offsite impacts local scale: mid-level offsite impacts wider scale: low level Short-term impact to an area of high conservation value or special significance[^] Specific Consequence Criteria (for environment) are exceeded 	<ul style="list-style-type: none"> Adverse health effects: mid-level or frequent medical treatment Specific Consequence Criteria (for public health) are exceeded Local scale impacts: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> onsite impacts: mid-level offsite impacts local scale: low level offsite impacts wider scale: minimal Specific Consequence Criteria (for environment) are at risk of not being met 	<ul style="list-style-type: none"> Adverse health effects: low level or occasional medical treatment Specific Consequence Criteria (for public health) are at risk of not being met Local scale impacts: mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> onsite impacts: low level offsite impacts local scale: minimal offsite impacts wider scale: not detectable Specific Consequence Criteria (for environment) likely to be met 	<ul style="list-style-type: none"> Specific Consequence Criteria (for public health) are likely to be met Local scale impacts: low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> onsite impact: minimal Specific Consequence Criteria (for environment) met 	<ul style="list-style-type: none"> Local scale: minimal to amenity Specific Consequence Criteria (for public health) met

[^] Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*.

* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*.

"onsite" means within the Prescribed Premises boundary.

7.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk Treatment Table 13 below:

Table 13: Risk treatment table

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
High	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

7.4 Risk Assessment – Direct and indirect discharges to land

7.4.1 Description of Risk Event

Stormwater that has come into contact with piggery waste has the potential to impact on the health of the surrounding surface water ecosystems, contaminate soil over time and seep into the underlying groundwater. The main areas at risk include:

- Stormwater can come into contact with spent bedding containing manure and waste feed, which has spilled over from the piggery sheds. Stormwater can also become contaminated on contact with manure in the livestock passageways between the sheds; and
- The Spent Bedding Storage Pad and Carcass Storage Piles are located on areas which are uncovered, unlined and not bunded.

Contaminated stormwater runoff in areas where solid wastes are applied to land has been risk assessed in Section 7.5.

7.4.2 Identification and general characterisation of emission

Intensively housed pigs continuously generate manure and spilt feed contaminated wastes that are rich in nutrients (nitrogen, phosphorus, potassium and a range of minor nutrients and trace elements including sulphur, zinc, copper, magnesium plus salts and pathogens). According to the NEGIP, the manure and waste feed produced by one SPU contains approximately 90kg of volatile solids (VS)/year.

7.4.3 Description of potential adverse impact from the emission

Contaminated stormwater, rich in nutrients and salts, has the potential to adversely impact on the ecosystem health of the surrounding environment. In particular, there is a surface water line 21m north of the Spent Bedding Storage Pad which feeds into Commitine Brook. Heavy and continuous rainfalls during the winter months could lead to flows from the Commitine Brook impacting on the Hotham River (refer Figure 7), causing eutrophication and excessive algae growth in the down-stream river system.

Leachate rich in nutrients and salts can seep through the clay base of the solid waste storage areas into the surrounding soil, affecting the soil structure. There is also the potential for leachate to seep into the underlying superficial aquifers, lowering the beneficial use of this resource, with potential impact on farmers dependent on local groundwater supplies to

supplement drinking and livestock water. The Licence Holder abstracts water from bores, located at approximately 70m below ground level, for stock watering purposes. The quality of the bore water within the premises boundary has a salinity of 7,000mg/L TDS. However, no other data exists for baseline comparison with other potential contaminants and it is likely that surficial or shallow aquifers seasonally discharge into the surface water drainage channels, providing support for deep rooted vegetative species to survive during the dryer months of the year.

7.4.4 Criteria for assessment

A direct or indirect discharge of contaminated stormwater should not occur during operation of the piggery other than after an extreme rainfall event. Based on the location of the piggery, the ANZECC Livestock drinking water guidelines are considered an appropriate assessment criteria to assess any potential impact on the quality of nearby surface water bodies. ANZECC recommends both short term and long term trigger values to monitor concentrations of concern for livestock drinking water quality.

This assessment has reviewed the Licence Holders controls, as set out in Table 14:

Table 14: Licence Holder’s controls for leachate and contaminated stormwater runoff (from Application)

Source	Control / description
Stormwater in the vicinity of the pig sheds	<ul style="list-style-type: none"> • Sheds have weatherproof rooves to exclude incident rainwater; • Sheds have a concrete floor to prevent seepage of leachate into the underlying soils; and • Hay bales are located at the westerly end of the sheds to help block prevailing storms
Passageways	<ul style="list-style-type: none"> • There does not appear to be any measures in place to control stormwater runoff in the passageways used to transfer pigs between sheds or loading/off-loading of trucks
Spent Bedding Storage Pad	<ul style="list-style-type: none"> • The storage areas for both the spent bedding and carcass piles are on a clay base of unknown integrity; • Some of the incident rainwater and leachate on the carcass piles and Spent Bedding Storage Pad will be absorbed by the spent bedding; and • There is no stormwater diversion around the Spent Bedding Storage Pad and Carcass Storage Pile(s)
Carcass Storage Pile(s)	

7.4.5 Consequence

The Delegated Officer has taken into account the depth to groundwater (70m below ground level) and considers that any seepage from piggery operations into the underlying aquifers are likely to become diluted over distance. The Delegated Officer also notes there are minimal groundwater bores in the vicinity of the piggery. With regards to contaminated stormwater runoff, the Delegated Officer considers that impacts would be low level on-site and minimal off-site on a local scale. This is based on the distance to the Commitine Brook and Hotham River and depth to groundwater. The Delegated Officer therefore considers the consequence of nutrient rich leachate or runoff to land impacting on nearby environmental receptors to be **Minor**.

7.4.6 Likelihood of risk event

Considering the low rainfall experienced in the area and the ephemeral nature of the nearby surface water bodies, the Delegated Officer has determined that minor impact from nutrient rich

leachate or contaminated stormwater runoff to land during normal operations will probably not occur in most circumstances. The Delegated Officer therefore considers the likelihood of nutrient rich leachate or runoff during operations to be **Unlikely**.

7.4.7 Overall rating for leachate or contaminated stormwater runoff

The Delegated Officer has compared the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 11) and determined that the overall rating for the risk of adversely impacting groundwater and surface water during operation is **Medium**.

7.4.8 Key Findings

Key Finding: *The Delegated Officer has reviewed the information regarding discharges of contaminated runoff to land and has found:*

The Licence Holder has not provided permeability testing results or certification results from a suitably qualified Engineer for the infrastructure constructed, in particular:

- *bases for the Spent Bedding Storage Pad and the Carcass Storage Piles, were to achieve a permeability of 1×10^{-9} m/sec.*
- *stormwater was to be directed away from all pig sheds;*
- *the controlled drainage pad to be bunded at the sides to contain leachate and prevent egress of stormwater and include a sump to collect rainfall and leachate;*
- *the floor and drainage system of all sheds to be designed to prevent the discharge of effluent to the environment.*

7.5 Risk Assessment – Application of solid waste to land

7.5.1 Description of Risk Event

As noted in Section 4.3.3, the Licence Holder intends to apply solid wastes containing spent bedding and decomposed carcasses to surrounding paddocks. Poor application practices can lead to a range of environmental concerns including odour emissions and nutrient rich stormwater runoff can impact on nearby surface water bodies.

7.5.2 Identification and general characterisation of emission

Solid wastes (decomposed carcasses and spent bedding) applied to land will contain high levels of nutrients and salts as well as other trace elements, as shown in Table 6, where the typical nutrient content of spent bedding from deep liter piggeries differs according to the type of bedding used. The proposed Reuse Areas have not been specifically mapped but, based on Figure 7, there are minimal areas containing remnant native vegetation.

7.5.3 Description of potential adverse impact from the emission

As noted in Section 4.3.3, there is sufficient land available for the spreading of solid wastes to ensure that the total phosphorus application rate is not exceeded. However, long term over-application of nutrients and salts to the soil can interfere with plant growth, nitrogen uptake and poor performance of crops. Similarly, if not applied evenly, it can cause drainage problems and soil degradation, leading to soil erosion. There is the potential for nutrient rich stormwater runoff to contaminate nearby surface water bodies if there is insufficient separation distances between areas where solid wastes are applied. Based on the depth to groundwater at 70m below ground level, there is minimal potential for nutrients to seep into the underlying aquifers.

7.5.4 Criteria for assessment

APL 2015 (section 8.4) recommends management practices and nutrient application rates that will protect the surrounding environment, with consideration given to soil and surface water

protection and protection of amenity. In particular, the application rate needs to be equivalent to the rate at which the nutrients can be efficiently removed by the crop. The ANZECC Livestock drinking water guidelines are considered an appropriate assessment criteria to assess any potential impact on the quality of nearby surface water bodies.

7.5.5 Licence Holder controls

This assessment has reviewed the controls, as set out in the dot points below:

- The spent bedding and carcasses are stored in designated areas and allowed to decompose for a minimum of 6 to 12 months prior application to the surrounding fields in February / March;
- The piggery is located on a total of 1,158ha of land where approximately 1,100ha is available for cropping (refer Figure 7); and
- There does not appear to be any measures in place to control stormwater runoff in areas where spent bedding and decomposed carcasses have been applied to land.

7.5.6 Consequence

The application of nutrient rich solids must achieve a balance between the amount of nutrients and trace elements applied and the amount removed by plants. Based on the expected concentration of nutrients per hectare as calculated in Section 4.3.3, there is sufficient land but buffers around environmental features need to be included. The Delegated Officer therefore considers the consequence of the Risk Event is considered to be **slight** with minimal on-site impact.

7.5.7 Likelihood of Risk Event

The Licence Holder has sufficient property to ensure that the land is not degraded. Therefore, the Delegated Officer considers that the risk event is **unlikely** to occur in most circumstances.

7.5.8 Overall rating for the application of solid waste to land

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 11) and determined that the overall rating for the risk of waste application to land is **Low**.

7.5.9 Key findings

The Delegated Officer has reviewed the information regarding waste applied to land and has found:

- *Based on the amount of solid wastes expected to be produced at the piggery, there is sufficient cropping land available to ensure the nutrient loading for phosphorus is not exceeded; and*
- *Buffers and stormwater management are required between the areas where solid waste is applied and any nearby surface water line, neighbouring properties and roads.*

7.6 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 15 below. Controls

are described further in Section 8.

Table 15: Risk assessment summary

#	Description of Risk Event			Licence Holder controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	Source	Pathway/ Receptor (Impact)			
1.	Leachate and contaminated stormwater runoff	Pig sheds, Spent Bedding Storage Pad, Carcass Storage Piles & application of solid waste to land	Leachate contaminating groundwater (at 70m depth); Direct discharge to nearby surface water line	Sheds have roofs and concrete floors; solid waste stored on clay base	Minor consequence Unlikely likelihood Medium Risk	Acceptable subject to proponent controls conditioned / outcomes based controls
2.	Application of solid waste to land	Spent bedding and decomposed carcasses applied to land	Excessive nutrient loading to land	Solid wastes allowed to compost prior application to land;	Slight consequence Unlikely likelihood Low Risk	Acceptable subject to proponent controls conditioned / outcomes based controls

8. Regulatory controls

The risks are set out in the assessment in section 7 and the controls are detailed in this section. DWER will determine controls having regard to the adequacy of controls proposed by the Licence Holder. The conditions of the Licence will be set to give effect to the determined regulatory controls.

8.1.1 Infrastructure and equipment (construction requirements)

Table 16: Works – construction and location requirements

Infrastructure	Design, construction and installation requirements	Infrastructure location
Bunding	(a) Constructed of compacted earth or cement; (b) Minimum 300mm in height above the adjacent ground surface; (c) Be continuous around the perimeter; and (d) Be impervious to stormwater runoff	(a) Spent Bedding Storage Area, and (b) Carcass Storage Piles

Infrastructure	Design, construction and installation requirements	Infrastructure location
Contaminated stormwater runoff collection sumps	(a) The sumps are to be suitable to contain all incident rainwater and any leachate and runoff from within the bunded areas; (b) The sumps are to have a clay base which can achieve an hydraulic conductivity of 1×10^{-9} m/second; (c) The sides of the sumps are to be constructed from compacted clay; (a) The sumps are to have sufficient capacity to contain incident rainwater and runoff from a 1 in 10 year, 24 hour ARI within the bunded areas.	(a) One sump is constructed within the bunding of the Spent Bedding Storage Pad; and (b) One sump is to be constructed within the bunding of the Carcass Storage Pile area
Stormwater diversion channels	(a) Constructed so that all stormwater is directed away from the specified locations	(a) All pig sheds (b) Spent Bedding Storage Area, (c) Carcass Storage Piles; and (d) All animal passageway areas

8.2 Construction Compliance Report

Following construction of the infrastructure noted in Table 16, the Licence Holder is required to provide a Report which demonstrates compliance with the requirements of Table 16

8.3 Infrastructure and equipment (operations)

8.3.1 General conditions - Stocking densities and management

- No more than 7,000 SPUs must be held on the piggery at any one time;
- The maximum monthly SPUs must be provided in the Annual Environmental Report.

Note: CEO requirement. The production capacity is derived from the Application and it is consistent with the assessed production capacity for the Works Approval. The Licence Holder will be required to report monthly maximum SPUs in the Annual Environmental Report.

Grounds: Risks identified on site are linked to the assessed production capacity of SPU. Consistent with DWER's *Guidance Statement: Risk Assessments*, the production capacity will be conditioned as it lowers the assessed likelihood of risk events associated with leachate and contaminated surface runoff. Monitoring of numbers is required for DWER to confirm compliance with the limit and also for the purposes of implementing destocking requirements, if required.

8.3.1 Infrastructure and equipment requirements

Table 17: General conditions - Operational controls

Site infrastructure and equipment	Operational Requirements
Piggery Sheds	<ul style="list-style-type: none"> (a) Mortalities are to be collected from the Piggery Sheds on a daily basis and disposed to the Carcass Storage Pile(s); (b) Ensure that sufficient dry straw bedding is evenly spread across the surface area of each piggery shed to ensure no less than 40 percent of the surface area of each shed's bedding is maintained as dry while pigs are accommodated in the shed; and (c) Ensure that all bedding is removed from the piggery shed after each batch of pigs is removed and new bedding is placed in the Piggery Sheds prior to the next batch of pigs being accommodate in that Piggery Shed
Stormwater Management	<ul style="list-style-type: none"> (a) Stormwater diversion channels are maintained around all Piggery Sheds, The Carcass Storage Pile(s), the Spent Bedding Storage Pad and Passageways (b) All contaminated stormwater runoff from within bunded areas is directed to a Collection Sump; (c) All accumulated sediments are removed from the Collection Sumps on an annual basis and the sediments discharged to the Carcass Storage Pile(s) or Spent Bedding Storage Pad
Spent Bedding Storage Pad	<ul style="list-style-type: none"> (a) Spent bedding is stored for a minimum of six months on the Spent Bedding Storage Pad prior spreading on the surrounding paddocks; and (b) Trees and other deep rooted plants are not to be planted within one metre of the Spent Bedding Storage Pad
Carcass Storage Pile(s)	<p>The area where carcasses are stored is to achieve the following:</p> <ul style="list-style-type: none"> (a) Carcasses are placed separately in the Carcass Storage Pile(s), allowing a minimum of 15-200mm spent bedding / bulking material between each carcass; (b) Carcasses are completely covered with spent straw / bulking material immediately following placement in the Carcass Storage Pile(s) to ensure that no parts of the carcass remain exposed; (c) Carcass Storage Piles are turned at a minimum of once every six months; (d) Carcass Storage Pile(s) are allowed to decompose for a minimum of 8 months prior spreading on the surrounding paddocks; (e) Sufficient stockpiles of spent bedding and bulking material are maintained close to the Carcass Storage Pile(s) to allow daily cover of carcasses; and (f) Trees and other deep rooted plants are not to be planted within one metre of the Carcass Storage Pile(s).

Notes: The above conditions are consistent with the requirements provided by Australian Pork Limited, in particular the *NEGIP; APL 2015; and Minimising Odour, APL 2015* (refer Appendix 1).

Grounds: Bunding around areas where nutrient rich wastes are stored is necessary to divert clean stormwater and protect surface water quality and areas containing remnant native vegetation. Bunding will prevent the solid waste stockpiles from becoming too wet which can increase odour emissions and attract flies, mosquitoes and rodents.

All incident stormwater and leachate from the Spent Bedding Storage Area and the Carcass Composting Pile(s) is to be directed to a collection sump in order to protect the surrounding area from nutrient rich runoff.

8.3.2 Specified actions – Application of solid waste to Reuse Areas

Table 18: Application of solid waste to Reuse Areas

Specified Emissions	Operational requirements
Application of solid waste to Reuse Areas	<ul style="list-style-type: none"> (a) Application of solid waste to Reuse Areas is not to occur during periods when heavy rainfall is expected or the soil is very wet; (b) Solid waste is to be applied evenly; (c) A 50m buffer is to be provided between the solid waste Reuse Areas and the nearby surface water line(s); (d) A separation buffer of 25m is to be maintained between the reuse area and all neighbouring boundaries; (e) A separation buffer of 50m is to be maintained between the Reuse Areas and public roads carrying more than 50 vehicles per day; (f) A separation buffer of 25m is to be maintained between the Reuse Areas and public roads carrying less than 50 vehicles per day; and (g) A separation buffer of 5m is to be maintained between the Reuse Areas and the internal roads, sheds and other infrastructure.

Notes: The above conditions are consistent with the requirements provided by Australian Pork Limited, in particular the *NEGIP; APL 2015; and Minimising Odour, APL 2015* (refer Appendix 1).

Grounds: In order to prevent nutrient rich runoff impacting on surface water bodies and remnant vegetation, the spreading of solid wastes should not occur if the soil is very wet or heavy rain is expected.

It is important to protect local amenity from odour emissions by applying buffers between neighbouring properties, roads and environmental surrounding environmental features.

9. Determination of Licence conditions

The conditions in the issued Licence in Attachment 1 have been determined in accordance with the *Guidance Statement: Setting Conditions*. The *Guidance Statement: Licence Duration* has been applied and the issued licence expires in 20 years from date of issue.

Table 19 provides a summary of the conditions to be applied to this licence. DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the licence under the EP Act.

Table 19: Summary of conditions to be applied

Condition Ref	Grounds
Infrastructure and equipment (construction requirements) Conditions 2 to 4	These conditions are valid, risk-based and contain appropriate controls
Construction Compliance Report Conditions 5 and 6	These conditions are valid, risk-based and contain appropriate controls.
Infrastructure and Equipment – Operational controls for the management and minimisation of controlled and uncontrolled discharges Conditions 7 and 8	This condition is valid, risk-based, contains appropriate controls and consistent with the EP Act

Limit on Holding Capacity Condition 9	This condition is valid and based on the identified maximum holding capacity of Adelong Farm
Information and reporting Conditions 10, 11, 12, 13, 14 and 15	These conditions are valid and necessary administration and reporting requirements to ensure compliance

10. Licence Holder's comments

The Licence Holder was provided with the draft Decision Report and draft issued Licence on 11 June 2019. The Licence Holder's comments on the draft documents are summarised, along with DWER's response, in Appendix 2.

11. Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this Decision Report (summarised in Appendix 1).

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

Caron Goodbourn
MANAGER, PROCESS INDUSTRIES

Officer delegated under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Email from Licence Holder Subject: Application for a Licence form, dated 7 December 2018	The Application	DWER records (A1746575)
2.	Email from Licence Holder Subject: Application for a Licence form, dated 7 September 2018 containing details of piggery operations	Licence information	DWER records (A1722652)
3.	Works Approval Application and supporting information	Works Approval Application	DWER records: A1584042
4.	Advice: Contaminated Sites Principal Hydrogeologist re		DWER records : A1637954
5.	<i>National Environmental Guidelines for Indoor Piggeries</i> , Australian Pork Limited, May 2018	NEGIP	Accessed at: http://australianpork.com.au/industry-focus/environment/national-environmental-guidelines-for-piggeries/
6.	<i>National Environmental Guidelines for Piggeries</i> , Australian Pork Limited, 2010	NEGP 2010	Accessed at: http://australianpork.com.au/industry-focus/environment/national-environmental-guidelines-for-piggeries/
7.	<i>Piggery Manure and Effluent Management and Reuse Guideline</i> , Australian Pork Limited, May 2015	APL 2015	Accessed at: http://australianpork.com.au/wp-content/uploads/2013/10/PMEG_2014_14_Ir.pdf
8.	<i>Minimising Odour from Piggeries</i> , Australian Pork Limited, 2015	Minimising Odour, APL 2015	Accessed at: http://australianpork.com.au/wp-content/uploads/2013/10/BMP02_MOFP_2015_06_Ir.pdf
9.	<i>Deep-litter housing for pigs</i> , Prime Facts #68, NSW DPI, March 2006	Prime Facts #68	Accessed at: http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0020/58403/Deep_litter_housing_for_pigs_-_Primefact_68-final.pdf
10.	DER, July 2015. <i>Guidance Statement: Regulatory Principles</i> . Department of Environment Regulation, Perth.	DER 2015a	Accessed at www.dwer.wa.gov.au
11.	DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	DER 2015b	
12.	DER, November 2016. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	DER 2016b	
13.	DER, November 2016. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	DER 2016c	
14.	Water Quality Protection Note 22: <i>Irrigation with nutrient-rich wastewater</i> , Department of Water, July 2008	WQPN 22,	Accessed at www.dwer.wa.gov.au

15.	Soils – Statewide, Geo Spatial Viewer 2019	Statewide Soils, 2019	Accessed at www.dwer.wa.gov.au
16.	<i>Composting dead pigs</i> , Jackie Linden, 12 February 2015	Linden, 2015	Accessed at: https://thepigsite.com/articles/composting-dead-pigs
17.	<i>Phosphorus Management in Pork</i> , Brad C. Joern & Alan L. Sutton Perdue University, 26 April 2010	Joern & Sutton, 2010	Accessed at: https://articles.extension.org/pages/27471/phosphorus-management-in-pork-production
18.	Meteorological Climate data and graphs for Cuballing	Willy Weather, 2019	Accessed at: https://www.willyweather.com.au/wa/wheatbelt/cuballing.html

Appendix 2: Summary of Licence Holder's comments on risk assessment and draft conditions

Condition	Summary of Licence Holder comment	DWER response
Condition 3 and Table 3 of licence	Extension of compliance timeframe from 31 August 2019 to 30 September 2019, as noted in Table 3. Justification for extension is winter creates wet areas and more time is required to allow the area around the piggery to dry out to allow heavy machinery to complete the infrastructure requirements.	Extension of compliance timeframe to 30 September 2019 granted

Attachment 1: Issued Licence L9186/2018/1
