



Application for a works approval

Division 3, Part V *Environmental Protection Act 1986*

Works approval number	W6457/2020/1
Applicant	Kingston Rest Pty Ltd
ACN	009 597 264
File number	DER2020/000526
Premises	'Kingston Rest Farms' 210 Norman Rd THE PLAINS WA 6237
Date of report	3 January 2023
Decision	Final

1. Purpose and scope of assessment

Kingston Rest Pty Ltd (the applicant) proposes to construct a large sheep feedlot facility near Capel, about 200 km south of Perth. An application for works approval was submitted under Division 3 Part V of the *Environmental Protection Act 1986* (EP Act) on 22 October 2020.

This report sets out the delegated officer's assessment of potential risks arising from emissions and discharges during construction and operation of infrastructure relating to the prescribed activity.

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

The applicant proposes to construct an intensive indoor (roofed) sheep feedlot in a staged manner. Only lambs will be kept within the feedlot, where they will be finished to a trade weight of 45 – 50 kg.

The proposal involves construction and operation of two feed sheds, and a third shed for the purpose of inducting new animals to the operation:

- Construction and operation of two roofed feed sheds, and associated load in/out facilities;
- Construction of a roofed shed for induction purposes;
- Construction of ponds for storage of harvested rainwater and surface water run-off for each shed setup; and
- Construction of a composting pad and containment pond.

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

Table 1: Prescribed premises category

Classification of premises	Assessed throughput (as per application)
Category 55: Livestock saleyard or holding pen: premises on which live animals are held pending their sale, shipment or slaughter.	Not more than 249,750 animals (lambs) per annual period

Proposal details

The proposal (intensive indoor sheep feedlot) is the second of its kind in Western Australia.

It is designed to enable the intensive feeding of animals in a manner that ensures their health and welfare is maintained, and to minimise the risk of impacts to human health and the environment that are commonly associated with outdoor feedlots, such as odour, dust and contamination of surface water and groundwater systems.

The applicant has given due regard to the *National Procedures and Guidelines for Intensive Sheep and Lamb Feeding Systems* (MLA 2020), which the Department of Primary Industries and Regional Development (DPIRD) considers to be an equivalent guideline in the absence of evidence-based guidelines for the construction and operation of indoor sheep feedlots in Australia.

Stocking density

The feed sheds will be constructed with a theoretical maximum design capacity of 15,000

lambs at any one time (total 30,000 lambs), based on an industry standard stocking density of 0.5 m²/head. However, the assessed capacity is maximum 18,150 animals (12,100 animals within the larger feed shed and 6,050 animals within the smaller feed shed, once both feed sheds have been constructed), and the induction shed with maximum 9,600 animals, based on a much lower stocking density that the applicant has advised each shed will be operated at (1 m²/head), to reduce the risk of animal welfare issues.

The feed sheds will be designed to receive lambs and hold them until they are fully grown (typically between 27 and 34 days). The applicant expects that over a 10-month season, each shed will have nine 'turnovers', equating to about 249,750 animals per year.

Shed design

The shed designs are modular and will comprise a galvanized roof and associated infrastructure to harvest and divert rainwater. Each shed will comprise a raised steel mesh floor, which will sit above a 30 mm thick hotmix hardstand pad.

The dimensions of the larger feed shed will be 256 m long and 56 m wide, with the smaller feed shed and induction shed will both be 128 m long and 56 m wide. All sheds will be 7.6 m high (from as-built ground level) The induction shed will be constructed separate to the shearing and wool sheds.

All sheds will be constructed with the following general design parameters:

- a general east – west orientation, to minimise impacts from wind and rain;
- saw-tooth design on the roof, to allow passive ventilation where the angle of the roof will allow hot air to rise out of the shed through gaps 1.5 m by 56 m every 33 m;
- a steel mesh floor, to allow manure and urine to pass through and be contained on a bunded hardstand pad (30 mm hotmix lining) beneath each shed;
- raised steel mesh floor will be constructed 3 m above the natural ground level, with all sides underneath the sheds to remain open to enable machinery access; and
- gutters and associated pipework, to enable to collection of rainwater.

Waste containment

All solid and liquid wastes generated by feedlot activities will be contained on a hardstand pad at the base of each shed. Unlike the properties of other livestock manure, sheep manure is dry and pelleted, and will generally remain intact when stockpiled. The applicant expects that urine falling through the mesh floor will be absorbed by the manure, and in combination with evaporation (even during the wetter months) the manure will remain dry and there will be no free moving liquids generated.

The hardstand pad at the base of each shed will comprise a slight bund around the edge, to prevent the ingress of surface water runoff external to the shed. Due to the dry nature of the manure, which will be scraped up once per year, underneath the sheds will never require washing out with water.

Composting infrastructure

A compost pad measuring 60 m x 30 m (1,800 m²) will be constructed to manage deceased animals from operations. The pad will comprise a hardstand of 30 mm hotmix with a 2% slope to divert surface water runoff and leachate away from the compost pile and towards a clay-lined evaporation pond. The pond will measure 56 m x 56 m x 1.6 m depth (4,800 m³ storage capacity, including a minimum pond freeboard of 0.9 m), which the applicant has calculated to be sufficient to contain major storm events (i.e., 1 in 20-year, 24-hour storm event) and runoff from a 90-percentile wet year (920 mm/yr).

Runoff dams

Clay-lined dams will be constructed at the foot of each set of sheds, to collect surface water runoff from perimeter roads and loading bays. Each dam will measure 90 m x 90 m x 2.5 m depth (13,700 m³ storage capacity, including a minimum freeboard of 0.5 m). Solids will be

allowed to settle out, and clean water used for stock watering purposes. During the winter months, surplus clean water will be allowed to overflow to the nearby brook.

Rainwater dams

Clay-lined dams will also be constructed at each set of sheds, to store harvested rainfall. Each dam will measure 90 m x 90 m x 2.5 m depth (13,700 m³ storage capacity, including a minimum freeboard of 0.5 m). Clean water will be used for stock watering purposes, and during the winter months, surplus clean water will be allowed to overflow to the nearby brook.

Construction schedule

Construction will occur one shed at a time, with each shed expected to take about 6 months to construct and about 3 years for the full project. The applicant advises it plans to commence operations following construction of the induction and first feed shed and continue operating whilst the second feed shed is being constructed.

The delegated officer notes construction of the induction shed was completed in mid-2021 following the grant of a building approval from the Shire of Capel and advised that any works carried out on the premises prior to the grant of a works approval would be done so at the applicant's own risk.

Operational aspects

Lambs will be brought onto the premises and trucked into the induction shed, where they will be kept for about 3 days. Each animal will be vaccinated, drenched and receive a vitamin supplement, before being drafted according to their weight and shorn to remove excess wool.

Drafted animals will then be transferred to the feed sheds, where they will be placed in a pen with other animals of similar weight and fed and watered for up to 34 days (average 30 days). The animals will be fed a pelleted ration on an ad-lib basis, where each animal will consume on average about 2 kg of feed and 4 litres of water per day. All feed will be brought onto the premises and stored in silos, and water requirements sourced from rainwater harvested from the shed roofs (about 90%) and the remainder supplemented by groundwater.

Entry weight will be about 35 kg and exit weight generally between 45 and 50 kg, depending on market requirements. Once the animals have grown to the required criteria, they will be trucked off-site directly to clients for slaughter.

Each shed will operate for up to 300 days per year, from 1 November through to 31 August. During the spring months (September – October), the applicant proposes to keep lambs outside of the sheds and fatten them by grazing pasture grown on the manure utilisation areas on the premises (see below), as part of the premises' nutrient offtake strategy.

Key notes:

- 1. The seasonal grazing of animals outside of the feed sheds following the commencement of feedlot operations has not been considered or assessed under this application, as this requires an update to the nutrient budget and offtake strategy. This aspect will instead be assessed as part of the licence application for ongoing operations.*
- 2. The grazing of animals outside of the feed sheds prior to the commencement of feedlot operations is permitted, as per current farming practices.*

Liquid waste management

The indoor (roofed) nature of the sheds will minimise the risk of stormwater mixing or coming into direct contact with solid wastes (manure). All rainwater will be harvested and used within the feedlot for stock watering purposes.

The applicant expects that during the cooler months urine will be absorbed within the manure beneath the feedlot facility and will evaporate during the warmer months. As such, the applicant does not expect there to be a wastewater stream generated from the feed shed operations.

Solid waste management

The steel mesh floor will allow manure to fall through, or be trodden through, onto the hotmix floor below. The applicant expects the manure piles that will gather over a 12-month period will be about 1 m tall beneath each shed, with about 12,600 tonnes/yr of dry sheep manure to be generated from the induction and feed sheds combined.

Once a year during autumn (before the season break), the applicant proposes to scrape up/remove the manure with telehandlers and bobcats. About 25% (3,216 tonnes) will be spread over paddocks on the premises to increase soil productivity (at a rate of 13.36 dry tonnes per ha), and the remaining 75% will be removed off-site and sold as product.

Management of deceased animals

The applicant expects a mortality rate of about 0.4%, which equates to about 1,790 animals per year. Dead animals will be transported from the sheds to a centralised and designated composting pad on the premises.

There will be daily inspections of the sheds where mortalities will be removed to the composting pad on the same day, laid in windrows on a layer of organic material at least 300 mm thick and covered with a layer of organic material at least 600 mm thick. Organic material will initially be sourced from existing compost stockpiles on the premises, and throughout operations will be supplemented by other organic material such as straw, sawdust and hay.

The profile of compost windrows will be peaked (triangular) to assist with water shedding. Windrows will also run north to south to facilitate unimpeded drainage of wastewater to the containment pond. Composting duration is expected to take around 16 weeks to complete, therefore about 600 carcasses will be being composted at any one time.

The applicant proposes to take the first cut of finished compost for spreading over paddocks on the premises to increase soil productivity (at a rate 13.36 dry tonnes per ha). This will occur once per year in autumn, before the break of the season (March – May), and remaining compost will be removed off-site and sold as product.

3. Infrastructure

Prescribed activity – category 55	
Livestock saleyard or holding pen – indoor sheep feedlot: 27,750 animals design capacity.	
1	Induction shed – maximum capacity 9,600 animals
2	2 x feed sheds – maximum capacity 18,150 animals (combined)
3	Compost pad (1,800 m ²)
4	Compost pad evaporation pond (1,307 m ³ including 0.9 m freeboard)
5	Runoff dams (14,000 m ³)
6	Stormwater pond (14,000 m ³)

Exclusions to this assessment

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

- other general farming activities being conducted on the premises, including but not limited to machinery movements, shearing shed, and wool shed operations, other livestock feeding and holding yards that are not within designated manure utilisation areas on the premises, centre pivot irrigation, etc.;
- surface water and groundwater licensing requirements (subject to separate approvals under the *Rights in Water and Irrigation Act 1914*);
- land use zoning and compatibility with surrounding land uses; and
- vehicle (i.e., livestock truck) movements on public roads.

The works approval is related to category 55 activities only and does not offer the defence to offence provisions in the EP Act (see s.74, 74A and 74B) relating to emissions or environmental impacts arising from non-prescribed activities, including those listed above.

4. Other approvals

Planning approval

The initial development application for the proposal was refused by the Shire of Capel (shire) in December 2021; it was subsequently determined by a Regional Joint Development Assessment Panel.

Planning approval was granted on 2 November 2022 for period of 4 years, and is subject to several conditions, including the requirement to conduct surface water monitoring to the satisfaction of the shire and on advice from the department; a post development odour impact assessment; development of a dust management plan; and submission of an environmental management plan to the shire.

5. Consultation

The application was referred to relevant public authorities and advertised for public comment on the department's website during November and December 2020.

Public authorities

DPIRD advises the environmental and design aspects of the proposal are entirely compliant with the elements of the *National Procedures and Guidelines for Intensive Sheep and Lamb Feeding Systems* (MLA 2020).

The shire has received several submissions from adjoining landowners raising concerns about the compatibility of a sheep feedlot in this location and potential land use conflicts.

Public submissions

Several submissions were received during the public comment period, in which several concerns were raised about potential impacts to human health and the environment, particularly impacts to local amenity from odour and dust, and impacts to the Gynudup Brook and its catchment.

In terms of impacts to local amenity from odour and dust, the following concerns were raised in several submissions:

- neighbours being impacted by odour from existing activities on the premises (beef feedlot, sheep grazing and composting operation), and concerns these issues will be exacerbated with an additional and much larger feedlot operation; and
- neighbours being impacted by dust from the current number of livestock truck movements on local unsealed roads and concerns these issues will be further exacerbated by increased traffic from the feedlot.

In terms of impacts to Gynudup Brook and its catchment, the following concerns were raised in several submissions:

- proximity of the feed sheds to the Gynudup Brook and related creek lines, being inconsistent with industry guidelines (MLA 2020), which presents an increased risk of surface water runoff contaminated with nutrients entering the brook;
- premises being in a high water table, low lying waterlogged area, where spreading of manure will increase the risk of nutrient-laden runoff entering the brook; and
- potential for overflow from the evaporation pond/compost pond to the brook during higher-than-average rainfall events.

Other matters

Several matters were also raised in submissions which are not directly related to emissions

and discharges from the proposal and are therefore beyond the scope of Division 3 Part V of the EP Act. These matters include animal health and welfare, biosecurity and disease, nuisance pests (flies, mosquitoes, and other vermin), heavy vehicle traffic on local roads, and devaluation of land.

6. Environmental siting

Physiography

The premises is located on farming land east of Capel, about 200 km south of Perth. It is located on the coastal sandplain surface geology unit at the foot of the Whicher Scarp, which forms part of the greater Swan Coastal Plain physiographic unit. The premises has a total area of 243 ha spread across four land titles, which is bounded to the west by Cain Rd, to the east by Gynudup Rd and to the south by Gavins Rd. The feed sheds are about 8.7 km east of the Capel town site.

Land use

Most of the site has been previously cleared for agricultural purposes. The surrounding land use is predominantly beef and dairy cattle, sheep grazing and heavy industry (mineral sands mining). There are nine rural dwellings within 1 km of the premises, with the closest being about 660 m west of the induction shed, and a further 12 dwellings within 2 km of the premises boundary, with many located between 920 m and 1.4 km from the feed sheds.

The amended course of the Gynudup Brook flows through the premises, which is about 200 m adjacent to the proposed feed sheds. No other specified ecosystems or areas of high conservation value have been identified in proximity that may be directly impacted by the proposed activities.

Climate

The Capel area experiences a Mediterranean climate that is characterised by warm to hot, dry summers and cool, wet winters. Weather patterns are dominated by the regular passage of rain-bearing cold fronts from the Indian Ocean in winter, and dry easterly air flows from inland areas in summer. Rainfall progressively declines as distance from the coast increases.

The nearest Bureau of Meteorology weather station is located at Donnybrook, about 14.5 km east-south-east of the premises. The average wind direction at 9 AM and 3 PM is presented in Figure 1, with the wind roses representing the various percentage of wind occurrences recorded during the period 1957 – 2020 (BOM 2020). The graphs illustrate predominantly moderate winds from the east in the mornings, shifting to moderate-to-strong afternoon westerly winds.

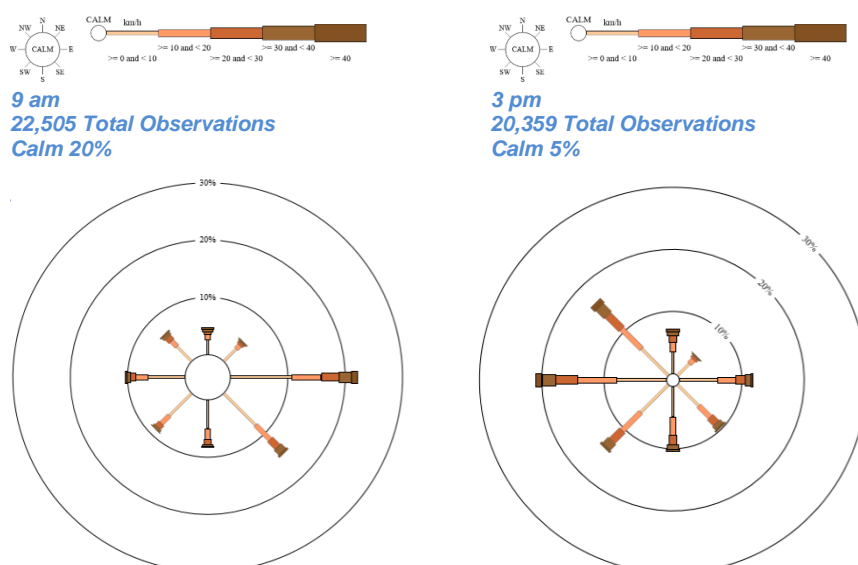


Figure 1: Wind roses, Donnybrook 1957 – 2020 annual average at 09:00 am and 3:00 pm

Surface water

The premises is located within the Gynudup sub-catchment of the Capel River surface water catchment, which has been extensively modified because of agriculture, through large scale clearing and the creation of drainage networks. This surface water catchment is subject to a *Water Quality Improvement Plan (WQIP) for the Vasse Wonnerup Wetlands and Geographe Bay* (DOW 2010), which is designed to address poor water quality and waterway health within the Geographe catchment.

Natural drainage at the site is via Gynudup Brook, which enters the premises from the south-east corner and exits in the north-west corner.

Gynudup Brook is the major surface water body in the local area and the entire site lies within its catchment. The brook originates in state forest on the nearby scarp and flows across the sandplain in a north-westerly direction, from where it is redirected through a major diversion drain (Elgin main drain) that eventually enters the Capel River to the north of the Capel town site. The Gynudup Brook flow is maintained by surface water runoff, especially from more clayey terrain, and by discharges from shallow aquifers by seepages which reach the brook often via agricultural drainage networks and natural tributaries. In addition to natural flows, there are several licensed and unlicensed discharges into the brook from mining, horticultural and agricultural operations, which influence the timing and size of flows across the year (Geocatch 2004).

Gynudup Brook is classified as a 'recovery catchment' in the WQIP (DOW 2010); community concern about the poor state of the brook also led to the development of a River Action Plan (Geocatch 2004), which identifies a number of drainage, water use and water quality issues that are of significant concern in the catchment, due in part to past and current land use and management practices. One issue is nutrient enrichment, which is mainly caused by manure and fertiliser being washed from paddocks; both nitrogen and phosphorus are above recommended water quality targets of 0.1 and 1.0 mg/L, respectively. Salinity varies between 800 and 2,000 mg/L total dissolved solids, with the higher concentrations due in part to the onset of winter rains and the associated flushing of salts from the catchment.

Groundwater

Beneath the premises the superficial formations, which in combination are referred to as the Superficial aquifer (in downwards succession: the Bassendean Sand, Guildford Formation and Yoganup Formation) overlie the deeper Leederville Formation and Bunbury Basalt.

The Bassendean Sand forms a thin and discontinuous surface layer, comprising pale grey and brown fine to medium grained sand. The Guildford Formation averages about 10 metres thickness and comprises sandy clay and clay facies, which have a very low vertical hydraulic conductivity and likely provide the conditions for short-term perched water. Thus, these sediments have high infiltration and limited storage capacity and are generally recharged to full capacity in the wet winter months. In the summer months, through-flow and evapotranspiration empty the aquifer. The perched water table generally reflects the surface topography during the winter months and declines in excess of 1.2 metres in the summer months.

Generally, the local groundwater quality within the Superficial aquifer is fresh to brackish, with salinity ranging from 800 to 2,000 mg/L total dissolved solids. Groundwater pH ranges from acidic to slightly alkaline (pH 5.0 to 7.6), with salinity values around 200 µS/cm.

Separation distances

The applicant has calculated the minimum separation distance to nearby sensitive receptors using a readily applied formula (the 's-factor' formula) outlined in the *National Procedures and Guidelines for Intensive Sheep and Lamb Feeding Systems* (MLA 2020).

The s-factor method was originally devised in Queensland for the cattle feedlot industry and has been adopted for other intensive livestock industries. It allows for a rapid and simple

assessment of potential air quality impacts (mainly odour) that does not require technically specialised and complex air quality modelling.

Given the two sets of sheds are located 1.5 km apart, they are not sufficiently close enough to be considered a single facility. S-factor calculations have therefore been determined for each set of sheds, with the results indicating there are no sensitive receptors located within the respective minimum separation distances.

As per the recommendations of MLA (2020), in situations where two feedlots (or a feedlot and some other intensive livestock facility) are in proximity, the likelihood of a cumulative impact must be considered in estimating required separation distances. With respect to this proposal, the two sets of sheds are closer than 120% of their combined separation distances from receptors. However, no sensitive receptors are located within the 120% overlap zone, therefore the normal separation distances apply (see Figure 2 below).

Kingston Rest: S-factor calculations		
Qualifier	Feed sheds	Induction shed
Minimum separation (m)	912	663
No. receptors within minimum separation	0	0
120% buffer (cumulative effects) (m)	1,094	795
No. receptors within 120% overlap zone	0	0

The delegated officer also notes there is existing intensive livestock (beef and sheep) feeding activities being conducted on the premises, however these activities will be discontinued once the indoor feedlot becomes operational.

7. 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 2020a).

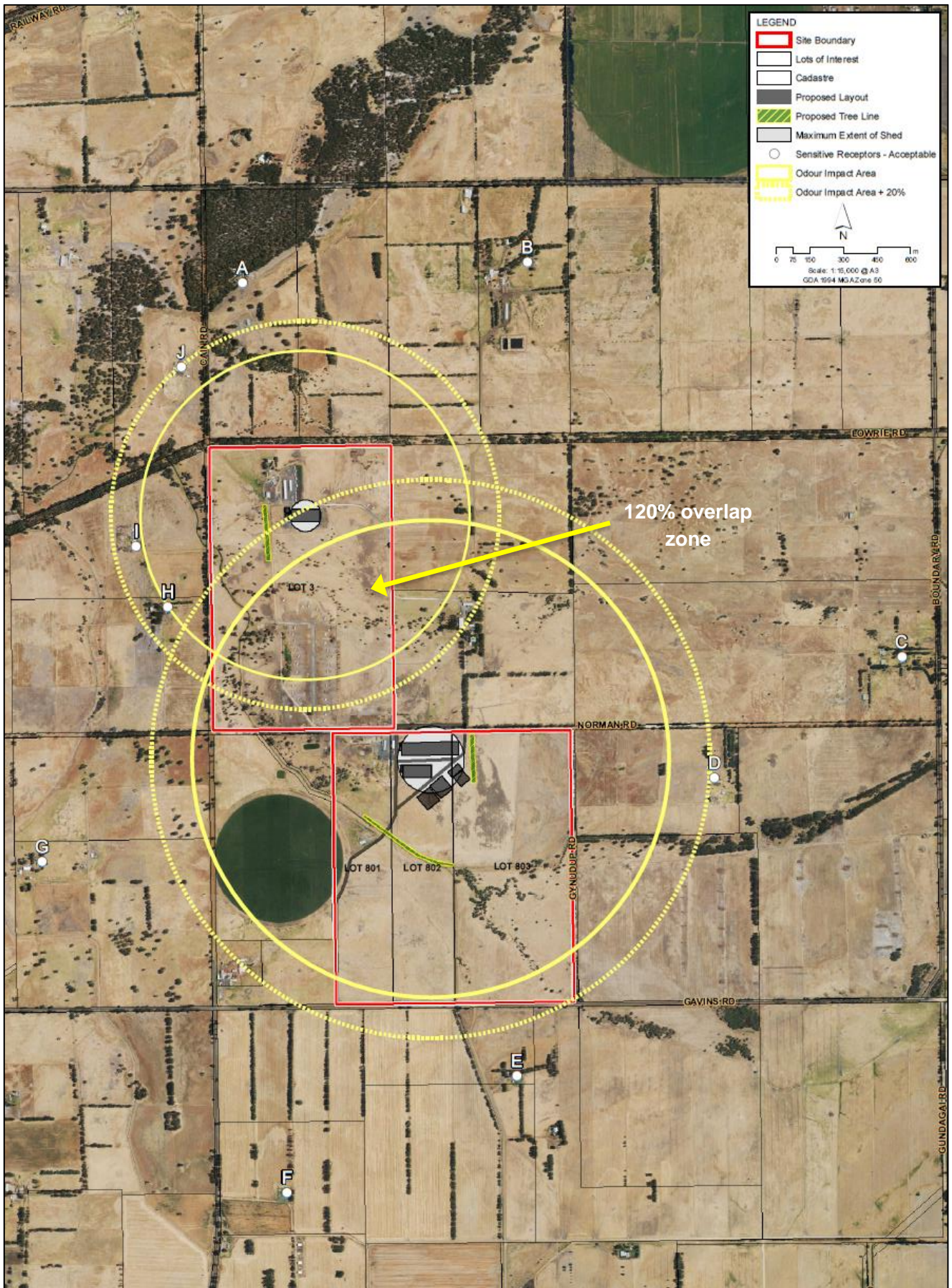
To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020a) 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 works approval 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.



▲ Figure 2: Cumulative odour impact

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 ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
Construction works								
Construction of sheds, internal roads and controlled drainage areas, dams and composting infrastructure	Noise and fugitive dust associated with construction civil excavation, earthworks, construction works, etc.	Unreasonable interference with the health, welfare, convenience, comfort or amenity of nearby noise sensitive receptors (9 dwellings within 1 km radius)	Short-term duration of works (~6 months per shed) Adequate separation to nearby receptors (<660 m induction shed, <920 m feed sheds) Construction work limited to normal daytime hours	Low-level off-site impacts to amenity Minor	Not likely to occur in most circumstances Unlikely	Low Acceptable, not subject to controls	Some additional noise and dust is expected during construction works, however due to the nature of the works levels are not expected to differ significantly from existing farming activities at the premises. The delegated officer has also considered the short-term nature of the works (~6 months per shed) and sufficient separation to off-site receptors (<660 m for induction shed, <920 m for feed sheds), and does not reasonably foresee that noise and dust from construction works will impact on off-site human receptors.	<u>Works approval controls:</u> None specified.
Operations								
Holding, feeding and watering of animals within indoor (roofed) feedlot sheds	Nutrient-laden leachate (from manure, urine), accumulated in stockpiles beneath sheds	Seepage/infiltration causing groundwater contamination	Sheds constructed with a roof Impermeable barrier (hot mix liner) to be installed beneath each shed	Mid-level on-site impacts Low-level off-site impacts on local scale Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	The indoor (roofed) nature of the sheds is expected to significantly minimise the volume of leachate generated from manure (urine, faeces, spilled feed, etc.), given it will not be exposed to rainfall runoff. Any potential leachates from stockpiled manure will be fully contained on a bunded impermeable barrier (hot mix liner), which will ensure the risk of groundwater contamination from seepage is acceptable. As the proposed controls are critical for maintaining an acceptable level of risk, they will be imposed on the works approval. To ensure an acceptable level of risk is maintained during operations, controls will be imposed on the licence to require the stockpiling of manure only on the bunded hardstand pads beneath the sheds.	<u>Works approval controls:</u> - Sheds must be constructed with a roofed structure; - Shed floors must be constructed with 30 mm hot mix hardstand; - Hardstand must be constructed with a containment bund. <u>Licence controls:</u> - Manure must be stockpiled on hardstand beneath the sheds.
	Odour, from animals within sheds and accumulated manure beneath sheds	Unreasonable interference with the health, welfare, convenience, comfort or amenity of nearby sensitive receptors (9 dwellings within 1 km radius)	Indoor (roofed) sheds (manure kept relatively dry) Manure stored underneath sheds only disturbed once per year Separation to nearby receptors (see above) Stocking density greater than industry standards	Mid-level off-site impacts to amenity on local scale Moderate	Could occur at some time Possible	Medium Acceptable, generally subject to regulatory controls	Due to the nature of intensive feeding systems, there is an inherent risk of odour causing impacts to off-site receptors. An appropriate separation distance needs to be in place in order to minimise the potential for odour impacts. The delegated officer considers the s-factor formula, as outlined in MLA (2020), to be an appropriate method for determining the minimum separation distances to sensitive receptors. S-factor calculations provided by the applicant, which have been verified by DPIRD and the delegated officer as part of this assessment, indicate there is adequate separation to nearby receptors. This is also the case when taking into account cumulative impacts. The delegated officer is therefore satisfied that more complex air quality modelling/odour assessment is not warranted. In verifying the s-factor calculations, the delegated officer considers the results to be relatively conservative, given the assumptions used in the calculations are based on an outdoor feedlot. The separation distances are likely to be greater for this proposal, due to the following factors: <ul style="list-style-type: none">- the indoor (roofed) nature of the operation that will keep manure relatively dry, compared to outdoor feedlots where manure is relatively moist or wet from exposure to rainfall runoff;- the indoor (roofed) nature which is unlikely to produce liquid wastes, compared to outdoor feedlots that require management of wastewater;- manure not being disturbed, compared to the regular requirement to clean pens with outdoor feedlots;- raised steel mesh floor, which does not generate dust, compared to outdoor feedlots in the summer months; and- proposed stocking densities, being greater than minimum industry standards. In addition, DPIRD advises there is considerable evidence to suggest that odour is greatly reduced for indoor feedlot operations. The delegated officer therefore considers there to be an acceptable level of risk in terms of odour impacts to nearby receptors. In order to ensure an acceptable level of risk is maintained during operations, controls will be imposed on the licence to require manure to only be disturbed once per year, and to prescribe a minimum stocking density per shed.	<u>Works approval controls:</u> None specified. <u>Licence controls:</u> - Stockpiled manure to be only disturbed once per year; - Maximum stocking density for each shed specified, based on 1 m ² /head

Risk Event				Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls
Source/ Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
	Noise, from animals bleating	Unreasonable interference with the health, welfare, convenience, comfort or amenity of nearby noise sensitive receptors (9 dwellings within 1 km radius)	Keeping animals within a roofed structure, out of the elements Ad lib feeding system, where animals are not waiting to be fed each day Separation to nearby receptors (see above)	Low-level off-site impacts to amenity Minor	Not likely to occur in most circumstances Unlikely	Low Acceptable, not subject to controls	Some noise is expected due to the intensive nature of the holding pens, however given the separation to nearby receptors and being located within a rural area, the delegated officer does not reasonably foresee off-site receptors being impacted.	<u>Licence controls:</u> None specified.
	Noise, from machinery movements		Machinery movements limited to normal daytime hours, wherever possible Separation to nearby receptors (see above)	Low-level off-site impacts to amenity Minor	Not likely to occur in most circumstances Unlikely	Low Acceptable, not subject to controls	Some additional noise is expected during operation of the feedlot; however, the nature of machinery movements is likely to be similar to existing activities at the premises, and given the separation to nearby receptors, the delegated officer does not reasonably foresee off-site receptors being impacted.	<u>Licence controls:</u> None specified.
	Surface water runoff, contaminated with nutrients (from manure, urine), salts, hydrocarbons, metals, etc.	Overland runoff to Gynudup Brook, causing surface water contamination	Sealing of perimeter roads and loading bays (controlled drainage area), runoff directed to lined containment dam with sufficient storage capacity	Mid-level on-site impacts Low-level off-site impacts on local scale Minor	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	Surface water runoff during rainfall events may become contaminated from operational areas and cause impacts to nearby creek lines if not controlled. All operational areas, including perimeter roads and loading bays, will be sealed and form part of a controlled drainage area, where runoff will be diverted to and contained within clay-lined dams. As the proposed controls are critical for maintaining an acceptable level of risk, they will be imposed on the works approval. To ensure an acceptable level of risk is maintained during operations, controls will be imposed on the licence to require the integrity of the containment dams to be maintained and any overflow is of an acceptable quality. Surface water monitoring in the Gynudup Brook has also been added to the works approval, to provide assurance over the effectiveness of the above controls and validate that feedlot operations are not impacting on the water quality of the brook. This monitoring will complement the existing surface water monitoring program conducted by the department's Vasse Taskforce as part of the Healthy Estuaries WA program (DOW 2010) within the Geographe catchment.	<u>Works approval controls:</u> - Controlled drainage area must be established, with all operational areas to be sealed; - Lined containment dams must be constructed (90x90x2.5m). <u>Licence controls:</u> - Surface water runoff from within controlled drainage area must be collected and contained with lined dams; - Water quality criteria set for overflow of surplus.
Composting	Odour from compost windrows	Unreasonable interference with the health, welfare, convenience, comfort or amenity of nearby sensitive receptors (9 dwellings within 1 km radius)	Compost windrows will only be disturbed once per year, once the material has fully composted Separation of pad to nearby receptors (<1 km)	Mid-level impact to amenity on local scale Moderate	Could occur at some time Possible	Medium Acceptable, generally subject to regulatory controls	Due to the nature of composting operations, there is an inherent risk of odour causing impacts to off-site receptors. The proposed composting of dead animals will be undertaken in accordance with the methods outlined in MLA (2020), where dead animals will be composted on a designated compost pad located near the feed sheds, windrows constructed and left undisturbed (no mixing or turning) for 4 – 6 months, depending on external air temperatures, moisture content of the composting pile and size of carcasses, which is expected to reduce the likelihood of malodour generation. Given the above and considering separation distances, the delegated officer considers there to be an acceptable level of risk in terms of odour impacts to nearby receptors. To ensure an acceptable level of risk is maintained during operations, controls will be imposed on the licence to specify minimum composting requirements.	<u>Licence controls:</u> - Windrows must be constructed with organic material as base – 5 - 6 m wide and minimum depth 60cm; - Carcasses must be covered with organic material at least 1.2m in the centre and at least 50cm on the sides; - Windrows must be no more than 2.6 m high; - Windrows must not be disturbed until full decomposition process has completed; - Organic material authorised to be brought onto the premises for use in composting includes straw, sawdust, hay and the like (other materials require approval).
	Nutrient-laden leachate from compost piles	Seepage/infiltration causing groundwater contamination	Compost pad to be constructed with an impermeable barrier (hot mix liner)	Mid-level on-site impacts Low-level off-site impacts on local scale Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	Leachates from the compost windrows will be fully contained on a banded impermeable barrier (hot mix liner) that will form part of a controlled drainage area, where runoff will be diverted and contained within a clay-lined dam. This will ensure the risk of groundwater contamination from seepage is acceptable. As the proposed controls are critical for maintaining an acceptable level of risk, they will be imposed on the works approval. To ensure an acceptable level of risk is maintained during operations, controls will be imposed on the licence to require all leachates and surface water runoff from the compost controlled drainage area to be collected and contained within a lined evaporation dam.	<u>Works approval controls:</u> - Controlled drainage area must be established, with compost pad to be sealed (60x30m); - Lined containment dam must be constructed (56x56x2.5m). <u>Licence controls:</u> - Surface water runoff from within compost controlled drainage area must be collected and contained with the lined dam.

Risk Event				Consequence rating ¹	Likelihood rating ¹	Risk ¹	Reasoning	Regulatory controls
Source/Activities	Potential emissions	Potential receptors, pathway and impact	Applicant controls					
		Overland runoff to Gynudup Brook, causing surface water contamination	Composting area to be constructed within its own controlled drainage area, with runoff directed to lined containment dam with sufficient storage capacity	Mid-level on-site impacts Low-level off-site impacts on local scale Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	Leachates generated by the compost area may cause impacts to nearby creek lines if not controlled. The compost pad will be sealed and form its own controlled drainage area, where runoff will be diverted and contained within a clay-lined dam. As the proposed controls are critical for maintaining an acceptable level of risk, they will be imposed on the works approval. To ensure an acceptable level of risk is maintained during operations, controls will be imposed on the licence to require the integrity of the containment dam to be maintained.	<u>Works approval controls:</u> - Controlled drainage area must be established, with compost pad to be sealed; - Lined containment dam must be constructed (56x56x2.5m). <u>Licence controls:</u> - Integrity of lined compost dam must be maintained.
Spreading of solid waste (manure)	Nutrient-laden leachate from manure	Overland runoff to Gynudup Brook, causing surface water contamination	Spreading to be conducted once per year during Autumn, before the season break Manure not to be applied within 50 m of Gynudup Brook and other creeks/waterways	Mid-level on-site impacts Low-level off-site impacts on local scale Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls	The applicant proposes to spread about 25% of the cumulative amount of both raw manure and compost per year over 232 ha of paddocks within the premises boundary, as an alternative to synthetic fertiliser. Therefore, there is a risk of the nearby creek line (Gynudup Brook) and seasonal shallow groundwater becoming contaminated by nutrient enrichment, caused by manure and fertiliser being washed from paddocks or from infiltration. The proposed application rate is 13.36 tonnes per ha of blended manure and compost, to be applied once per year before the break of the season (May to June), to ensure optimal uptake of nutrients by crops. A buffer of 50 m to the Gynudup Brook and other creeks/waterways will be applied. DPIRD advises it is satisfied the proposed rates of manure application are appropriate and acceptable, based on calculations undertaken using the NLAR equation in the <i>National Guidelines for Beef Cattle Feedlots in Australia</i> (MLA, 2012). The delegated officer therefore considers there to be an acceptable level of risk. To ensure an acceptable level of risk is maintained during operations, controls will be imposed on the licence to specify the maximum application rate of manure spread, limiting the time of spreading, and buffers to Gynudup Brook and other creeks/waterways.	<u>Licence controls:</u> - Maximum rate of application imposed 13.36 tonnes/ha mixed manure and compost; - Spreading of manure restricted to once per year (Autumn); - Must not spread manure within 50 m of Gynudup Brook and other creeks/waterways.
		Seepage/infiltration causing groundwater contamination	Manure to be applied at sustainable rates, well matched to the soil type and conditions (13.36 tonne/ha)	Mid-level on-site impacts Moderate	Not likely to occur in most circumstances Unlikely	Medium Acceptable, generally subject to regulatory controls		
	Odour, during and after spreading	Unreasonable interference with the health, welfare, convenience, comfort or amenity of nearby sensitive receptors (9 dwellings within 1 km radius)	Only fully composted material and non-fresh manure will be spread on the premises Spreading to be conducted once per year during Autumn, before the season break	Mid-level impact to amenity on local scale Moderate	Could occur at some time Possible	Medium Acceptable, generally subject to regulatory controls	The applicant proposes to spread manure and compost once per year, before the break of the season, which the delegated officer considers to be consistent with a typical farming/rural enterprise. Given the sheep manure and compost will be relatively dry, it is not expected to cause significant odour concerns when compared to spreading other forms of wet manure (cattle, pigs, chicken, other pond sludges, etc.). To ensure an acceptable level of risk is maintained, controls will be imposed on the licence to require spreading only when the prevailing weather conditions are unlikely to result in odour and dust impacts to nearby receptors.	
Livestock truck movements	Fugitive dust, from truck movements on gravel/unsealed roads		New internal road to be constructed in order for livestock trucks to enter/exit the premises via sealed Gavins Rd (instead of unsealed Norman Rd)	Low-level on-site impacts Minimal off-site impacts on local scale Minor	Not likely to occur in most circumstances Unlikely	Low Acceptable, not subject to controls	The applicant had initially proposed that Norman Rd (unsealed, gravel road) would be the primary road for livestock trucks (B-doubles) accessing the premises. However, in considering concerns raised in public submissions about the potential for dust impacts, the applicant will instead construct a new internal road for trucks to access the premises off Gavins Rd (sealed). Given the separation to nearby receptors, the delegated officer does not reasonably foresee off-site receptors being impacted by fugitive dust from truck movements within the premises boundary.	<u>Licence controls:</u> None specified.

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

8. Decision

The delegated officer has determined the proposal to construct and operate an indoor sheep feedlot on the premises, with an assessed annual throughput of 249,750 animals per year, does not pose an unacceptable risk of impacts to on- and off-site receptors. This determination is based on the following:

- the indoor (roofed) nature of the proposed feedlot, in which manure stockpiled beneath the sheds will not be exposed to rainfall runoff and will therefore stay relatively dry;
- there being sufficient separation to nearby (human) sensitive receptors, as determined by s-factor calculations (which are likely to be relatively conservative);
- the proposed stocking density of 1 m²/head, which is greater than the industry standard (0.5 m²/head);
- compost not being disturbed until being harvested for spreading or off-site removal, which is likely to generate less odour;
- shed floors and internal roads being sealed with 30 mm hot mix, to create an impermeable hardstand and minimise the risk of groundwater contamination;
- creation of controlled drainage areas around operational infrastructure, to contain and control surface water runoff and minimise potential impacts to nearby surface waters and groundwater; and
- mature compost and stockpiled manure being spread at acceptable application rates, and once per year during the dry period and with adequate separation to the Gynudup Brook.

The delegated officer also notes DPIRD has reviewed the proposal and considers the environmental and design aspects entirely comply with the elements outlined in equivalent industry guidelines (e.g., MLA 2020), with appropriate engineering controls proposed to address any identified deficiencies.

In order to minimise the potential for environmental impacts, the applicant has proposed the following engineering controls, which will be imposed on the works approval as they are considered critical to maintaining an acceptable level of risk:

- sheds must be constructed with a roofed structure;
- shed floors and compost pad must be constructed with a bunded, impermeable hardstand;
- all operational areas (including composting area) must be constructed within controlled drainage areas, which divert surface water runoff to lined containment dams; and
- lined containment dams must be constructed for each controlled drainage area.

The delegated officer is satisfied the above engineering controls lower the overall risk profile of the proposal, and adequately address the concerns raised in public submissions regarding the risk of impacts to local amenity from odour and dust and impacts to the Gynudup Brook and its catchment.

Works approval and licence

Works Approval W6457/2020/1 that accompanies this report authorises construction and time limited operations only. The conditions in the issued works approval, as outlined in the above risk table have been determined in accordance with the *Guideline: Setting Conditions* (DWER 2020b).

Following construction, a licence is required to authorise emissions associated with ongoing operation of the premises, i.e., sheep feedlotting activities. A preliminary risk assessment for the operational phase has been included in this report; however, licence conditions will not be finalised until the department assesses the licence application.

Conditions will be imposed to ensure day-to-day operations do not pose an unacceptable risk of impacts to on- and off-site receptors, and to address the concerns raised in public submissions.

Applicant comments on draft decision

The applicant was provided with drafts of the works approval and this report on 13 January 2021 and 20 December 2022. Only minor clarification and corrections were sought, which have been addressed in the final documents.

9. Conclusion

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

Caron Goodbourn
MANAGER, PROCESS INDUSTRIES
REGULATORY SERVICES

Delegated officer
under section 20 of the Environmental Protection Act 1986

References

1. Bureau of Meteorology (BOM) 2020, Climate Data Online, Monthly Statistics: Donnybrook (009534). Accessed.
2. Department of Water (DOW) 2010, *Vasse Wonnerup Wetlands Geographe Bay – Water Quality Improvement Plan*, Perth, Western Australia.
3. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Risk Assessments*, Perth, Western Australia.
4. DWER 2020b, *Guideline: Setting Conditions*, Perth, Western Australia.
5. Geocatch 2004, *River Action Plan for Gynudup Brook and Tren Creek*. Geographe Catchment Council.
6. Meat & Livestock Australia (MLA) 2020, *National Procedures and Guidelines for Intensive Sheep and Lamb Feeding Systems*. Meat & Livestock Australia Limited.
7. MLA 2012, *National Guidelines for Beef Cattle Feedlots in Australia, 2nd Ed.* Meat & Livestock Australia Limited.