

APPENDIX D – ODOUR RISK ASSESSMENT

Katestone Environmental Australia Pty Ltd

Organic Manure Processing: Odour Risk Assessment

Prepared for:

Mort & Co Ltd

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1. INTRODUCTION

Katestone Environmental Australia Pty Ltd (Katestone) was commissioned by Mort & Co to conduct an odour risk assessment as part of the Change Application (Other Change) – Material Change of Use – Intensive Animal Industry (Manure processing) for Mort & Co's Grassdale Feedlot located at 556 Grassdale Road, Grassdale.

In 2018, Mort & Co received Development Approval for a material change of use for extension to the existing cattle feedlot from 47,952 Standard Cattle Units (SCU) to a capacity of 70,000 SCU **including manure processing plant**. Condition 42.2 of the approval states that *Manure for composting must be sourced from the approved feedlot on-site*.

In May 2026 Mort & Co submitted a Change Application (Other Change) to allow receipt of manure from other feedlots for composting at the Grassdale Feedlot. No other changes to the Grassdale Feedlot activities are proposed by this application.

Following lodgement of the Other Change Application and supporting information to Toowoomba Regional Council (Council), Mort & Co received an Information Request from Council, dated 11 June 2026. Item 2 (reproduced below) of the Information Request relates to odour.

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2. Odour from Fertiliser Manufacture

Submit an odour risk assessment, prepared by a suitably qualified person in air quality and odour impacts that quantifies odour from the fertiliser manufacturing process and discusses any odour management measures required so odour nuisance at receptors does not occur. This may be included as part of the update to the Air Quality Management Plan note above Item 1 of this request) or as a standalone response.

Mort & Co has requested Katestone's support to address item 2 of the Information Request.

The odour risk assessment has required the following works:

- Conduct a site inspection of the manure composting and organic manure processing facilities
- Evaluate the odour risk associated with each activity
- Review odour management practices and make recommendations for additional management practices where required

2. BACKGROUND

2.1 Development permit

In 2018, Mort & Co received development approval for a material change of use for extension to the existing cattle feedlot from 47,952 Standard Cattle Units (SCU) to a capacity of 70,000 SCU **including manure processing plant**.

Conditions relevant to the manure processing facility are reproduced below.

MANURE PROCESSING FACILITY

42. *The manure processing facility must have a maximum Gross Floor Area (GFA) of 5,405m² and operated as an ancillary activity in relation to the approved feedlot as follows:*
- 42.1 *Products to be used in the composting process sourced from off-site are limited to materials such as biomass (plant material, sawdust, mulch etc. but excluding manure); gypsum, rock phosphate and other additives; and*
- 42.2 *Manure for composting must be sourced from the approved feedlot on-site.*
43. *The existing southern manure pad must be decommissioned and regressed within two (2) months of commencement of the use of the manure composting facility.*

MANURE PROCESSING FACILITY - AIR QUALITY & AMENITY - AIR QUALITY MANAGEMENT PLAN

44. *Prior to the issue of any Operational Works approval or Building Works approval, submit to Council for endorsement, and have endorsed, an Air Quality Management Plan for the operation of the manure processing facility prepared by a suitably qualified person that, at a minimum, includes the following:*
- 44.1 *A simple emissions inventory identifying the type and accounting the amount of primary pollutants discharged into the atmosphere from point, area and mobile sources over a specified time span relevant to the nature of the approved use.*
- 44.2 *Description of specific mitigation treatments, management methods and procedures that will be implemented to control the release of pollutants discharged to the air during the operation of the manure processing facility;*
- 44.3 *Procedures for notifying neighbouring residents of activities likely to affect their amenity;*
- 44.4 *A complaints management procedure that must include the following:*
- i) *A contact person with whom complaints can be lodged;*
 - ii) *A clearly defined procedure for responding to and investigating complaints*
 - iii); *A notification protocol to all complainants of the outcome of complaint investigations*
45. *The endorsed Air Quality Management Plan must be implemented, maintained and modified where necessary to maintain compliance with the requirements of this Development Approval at all times.*

2.2 Site layout and location

The Grassdale Feedlot comprises of the feedlot (pens, sedimentation basins and holding ponds), mill, manure composting area and the organic manure processing facility. The organic manure composting facility is located to the north of the site. Figure 1 illustrates the location of the various activities at the Grassdale Feedlot.

Figure 2 illustrates the location of the sensitive receptors relative to the organic manure composting facility. The closest receptors to the organic manure composting facility are 5.9km to the south-southeast and 6.4km to the north-northwest.

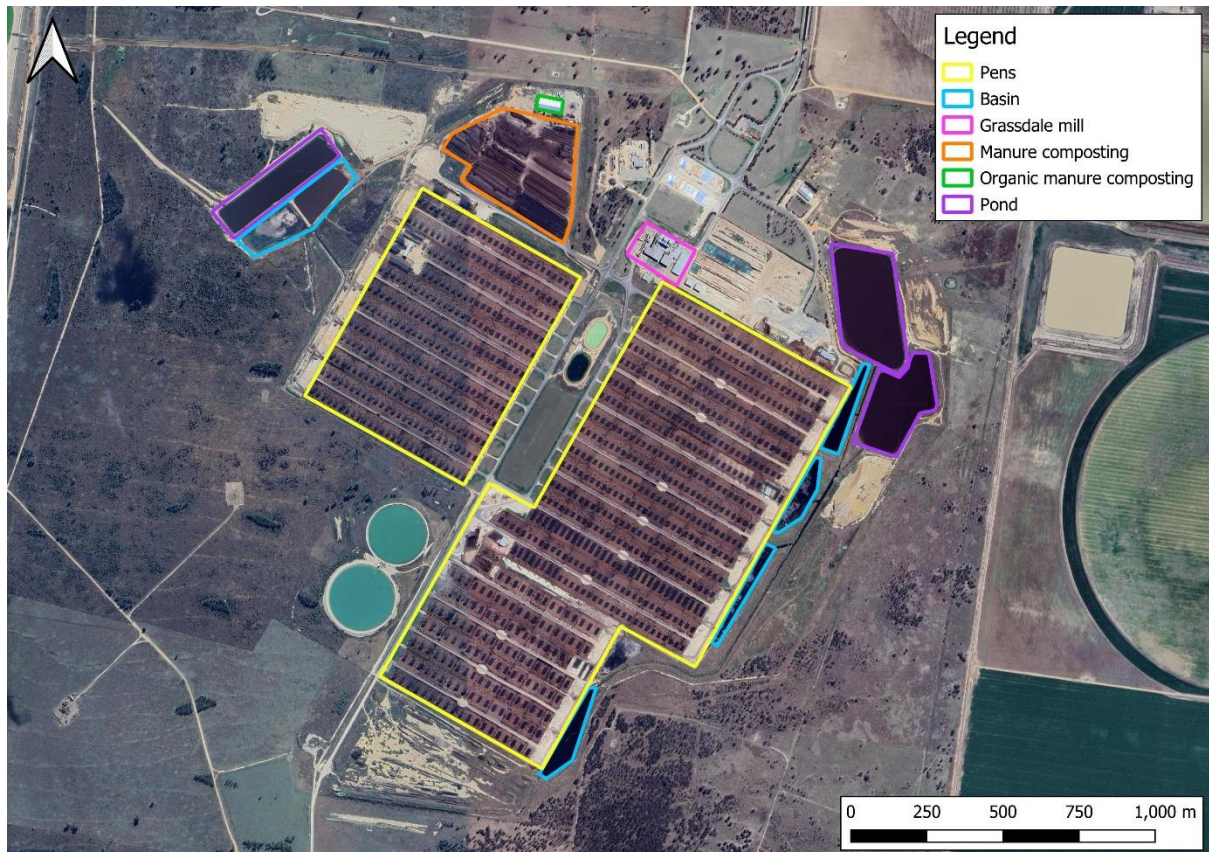


Figure 1 Aerial photograph of the Grassdale Feedlot showing the mill, manure composting and organic manure composting

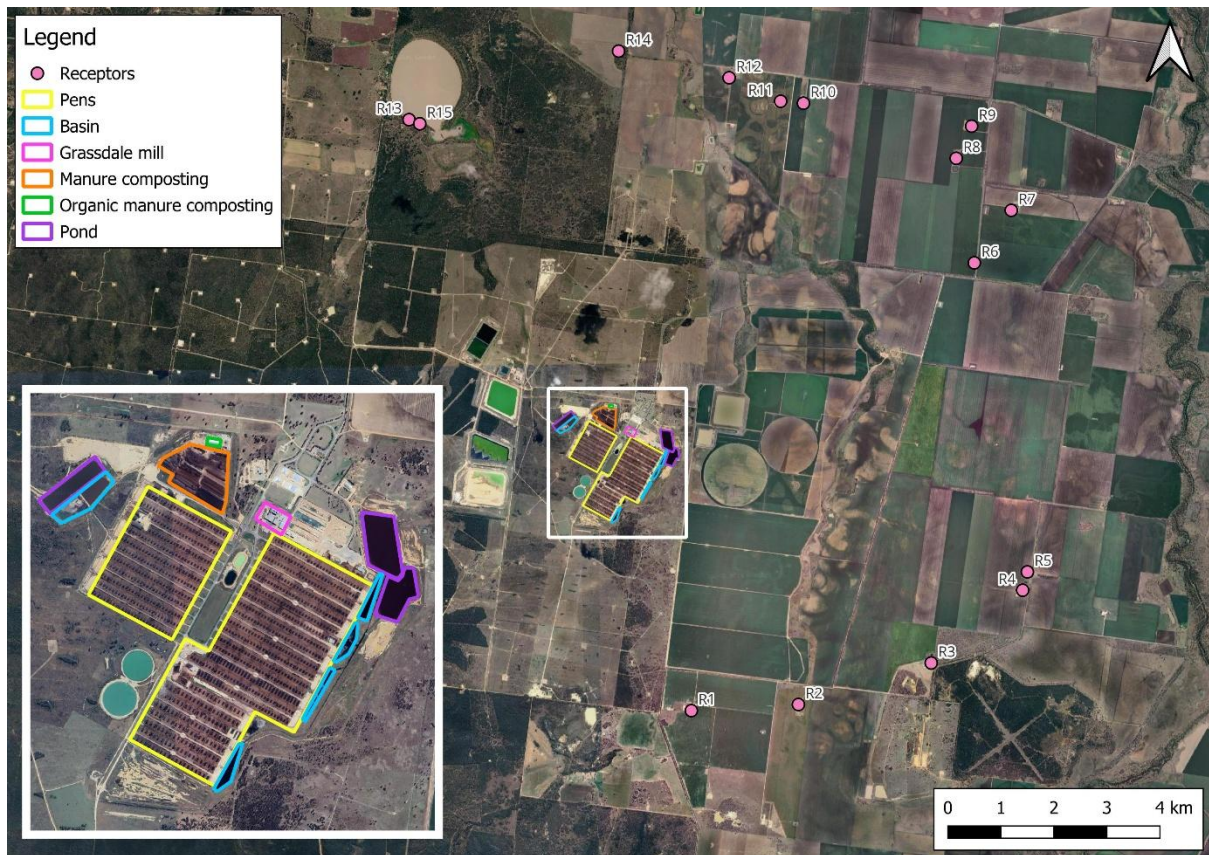


Figure 2 Aerial photograph of the Grassdale Feedlot showing the nearest sensitive receptors

2.3 Manure processing facility

The aim of the manure processing facility is to process stable compost to produce granules that:

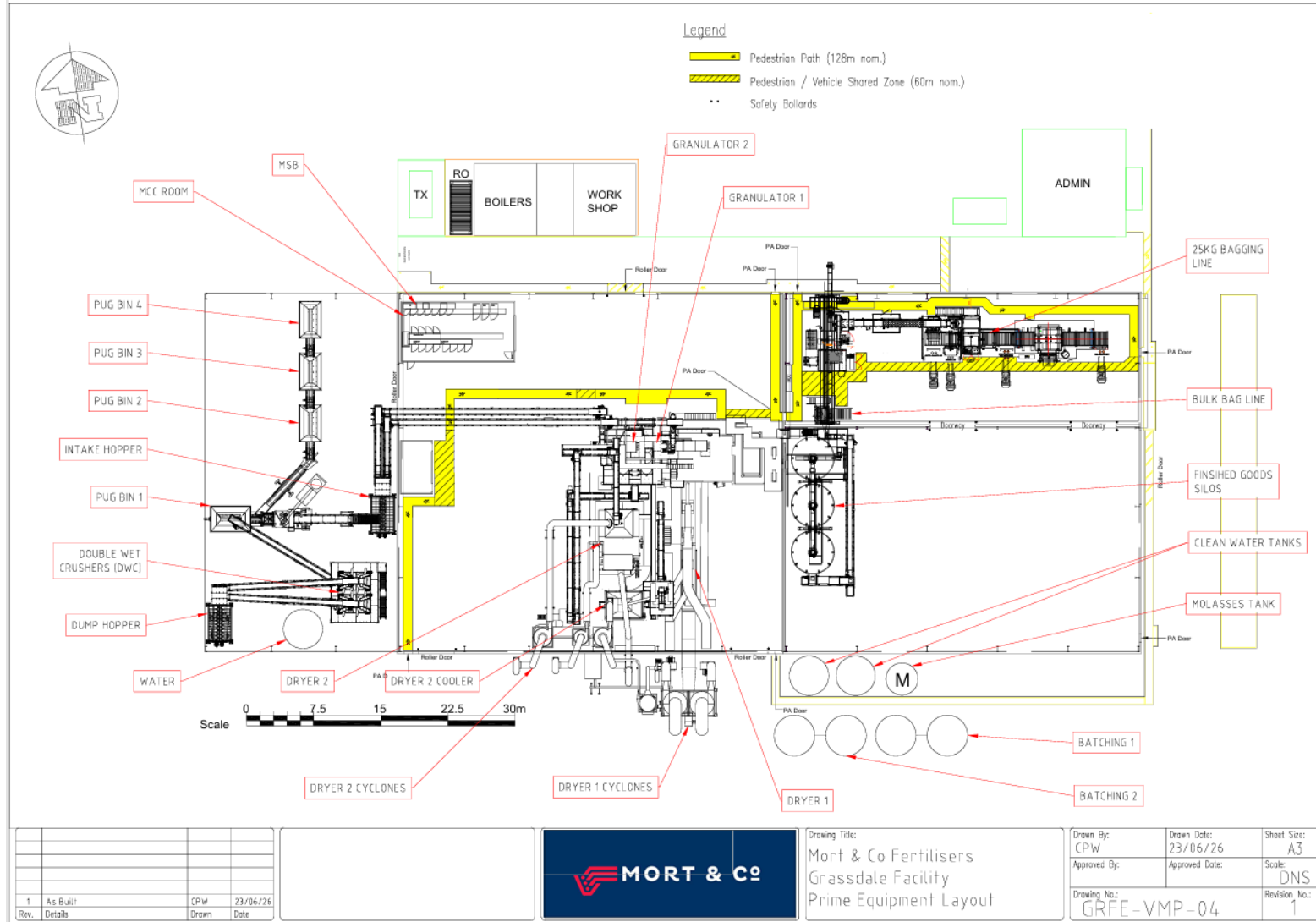
- improve soil condition and biological activity;
- provide a slow release of nutrients and trace elements;
- improve water penetration and water holding capacity and potentially;
- increase crop yields; and
- can be spread using conventional spreaders or an airseeder.

The manure processing facility composts manure to produce a matured and relatively dry compost. The compost is combined with other materials and processed to produce a granulated material for sale as a bulk material or in large or small bags.

Figure 3 provides a schematic of the equipment and key processes associated with the organic manufacturing facility. There are two lines, each with the capacity of achieving 10 tonnes/hour. Mort & Co advises that the facility has been operating at a total production rate of up to 6 to 8 tonnes per hour. Recent works will bring the total production rate up to approximately 12 to 15 tonnes per hour. The key aspects are summarised below. Full details are included in Mort & Co's *Process and Operational Management Overview* for the organic manure processing facility.

- Raw material handling and storage

- Raw material is stored in either silos (Meat and Bone meal, gypsum, sulphate of Potash and bentonite are stored in silos or bags
- Screened compost is transferred to the pugmill where additives are added to the individual bins and mixed.
- Material is then transferred to intake hopper with a loader and conveyed to the steam conditioners.
- Conditioning
 - The material is mixed with pressurised steam to elevate the temperature to appropriate levels to allow the addition of molasses and liquid binder additive as well as the mixing of the material to create a homogenous product ready for granulation.
- Granulation / rounding
 - The conditioned material is granulated and transferred to the rounders to generate spherical granules ready for drying. Conveyors take the granules from the rounders and transfer them to the dryers.
- Drying
 - The granules are dried to the desired finished product moisture. The granules are transferred from the dryer to the bulk storage and handling area via conveyor.
- Storage and handling
 - Dried granules are sieved, weighed and transferred by bucket elevators to the overhead silo filling conveyor system. Product is stored in the silos until ready for either bagging or loading to truck.



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Figure 3 Organic manure processing facility – equipment layout

3. ODOUR AND DUST

3.1 Regulatory framework

The *Environmental Protection Act 1994* (EP Act) provides for the management of the air environment in Queensland. The legislation applies to government, industry and individuals and provides a mechanism for the delegation of responsibility to other government departments and local government and provides all government departments with a mechanism to incorporate environmental factors into decision making.

The EP Act gives the minister the power to create the Environmental Protection Policies that aim to protect the environmental values identified for Queensland. The *Environmental Protection (Air) Policy 2019 (Air EPP)* specifies air quality objectives for air contaminants.

The relevant odour assessment guideline is the DETSI document titled: *Guideline-Odour Impact Assessments from Developments, 2024 (DESI, 2024)*. This document provides information on the appropriate methodologies and criteria for conducting odour impact assessments for new and expanding facilities.

3.2 Odour background

DETSI's Guideline recognizes that there is general agreement in the scientific community that frequency, intensity, duration, offensiveness and location (FIDOL) are factors that ought to be considered when attempting to judge the likelihood of odour nuisance, that is:

- the frequency (F) of the occurrence;
- the intensity (I) of the odour;
- the duration (D) of exposure to the odour;
- the offensiveness (O) of the odour; and
- the location (L).

3.3 Relevant EA and Development Permit conditions

The Grassdale Feedlot operates under Permit number 2017-22. The condition related to odour is reproduced below:

A1 Odour or airborne contaminant must not cause environmental nuisance to any sensitive place or commercial place.

With respect to Grassdale Feedlot's Development Permit, conditions specific to odour are reproduced below.

AIR QUALITY & AMENITY - AIR RELEASE LIMITS

36 Odours or airborne contaminants which are noxious or offensive to public amenity or safety, likely to cause environmental harm or environmental nuisance or exceed the Air Quality Objectives listed in the Environmental Protection (Air) Policy 2008 as measured at any sensitive receptor place must not be released to the atmosphere.

4. SITE INSPECTION OF ORGANIC MANURE PROCESSING FACILITY

A site inspection was conducted by Natalie Shaw, Team Leader Approvals at Katestone, attended the Grassdale Feedlot, on 19 June 2026. During the site inspection a walkthrough of the organic manure processing facility was undertaken. Personnel from Mort & Co and Mort & Co Fertilisers were questioned during the site inspection regarding aspects of the operation.

In addition to the inspecting the organic manure processing facility, the feedlot pens, sedimentation basins and manure composting areas (a combination of manure and composted manure) were inspected.

Distinct odour was observed at the feedlot pens and at the manure composting area. Whilst a subtle odour was detected at the sedimentation pond, it was not able to be characterised. The odour character at the pens was distinctly different to that of the manure composting area with the smell at the pens a musky, animal odour whilst the odour at the composting area was similar to that of a garden centre. No odour that could be attributed to the organic manure processing facility was observed when walking around the outside of the building.

Photos of each aspect are provided in Table 1.

Table 1 **Photos of key aspects of manure composting and organic manure processing facility**

Organic manure processing facility with manure composting area in the foreground	
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Manure composting – loading stockpiles with manure from feedlot



Manure composting screen



Manure composting windrows



Manure
composting
watering



Organic manure
processing
boilers



Organic manure processing - Raw material



Organic manure processing - Pugmill



Organic manure processing
-
Conditioner



Organic manure processing
-
Control panel



Organic manure processing - Dust extraction



Organic manure processing - Granulator



Organic manure processing - spheres



Organic manure processing - Dryer



Organic manure processing - Cyclone and exhaust from dryers. Dyer



Organic manure processing -bulk bagging area, 25kg bagging area and product



Organic manure processing – product bulk bags



5. RISK ASSESSMENT

5.1 Method

A qualitative odour risk assessment was undertaken to evaluate the potential for odour impacts at surrounding sensitive receptors due to the organic manure processing plant. The assessment was informed by the site inspection, during which the processing operations, odour-generating activities, and odour control measures were observed. Observations were made at various locations across the facility and in the vicinity of potential emission sources.

The risk assessment approach considers:

- Magnitude of odour emissions
- Odour character/offensiveness (hedonic tone)
- Distance of sensitive receptor from source
- Background odour levels

Depending on these factors, odour risk has been evaluated as either: low, medium or high.

5.2 Evaluation

A summary of each aspect of the organic manure processing facility along with controls and observations in relation to odour during the site inspection is summarised in Table 2. The magnitude of odour emissions from the organic manure processing facility are low. This is due to the material being processed (composted manure that has undergone significant degradation) and the control measures in place as well as Management Plans implemented on site to ensure the facility operates efficiently and effectively. No additional controls have been identified as being required.

Where odour was detected, it was subtle, making it difficult to characterise. Based on the 9-point hedonic scale, which ranges from “like extremely” to “dislike extremely” the odour character / offensiveness could be described as “5” or “neutral” on the hedonic scale, that is “neither liked or disliked”.

Sensitive receptors as identified in Figure 2 are located at 5.9 kilometres or more from the organic processing facility and given the low odour emissions from the facility, are unlikely to be adversely affected by odour from the organic processing facility.

With regards to other sources located within the Grassdale Feedlot, the odour from the feedlot pens and at the manure composting area was distinct. Any odour from the organic manure processing facility would be unlikely to be detected in comparison to those feedlot sources.

Table 2 Organic manure processing - controls, observations and odour risk

Activity / source	Controls	Observations	Magnitude of odour emissions
Raw material intake			
Storage of raw material	<p>Molasses is stored in silo</p> <p>Meat and bone meal is stored in bags, within shed</p> <p>Powder binders are stored in bags, within shed</p> <p>Gypsum stockpiled outside</p> <p>Composted manure is stockpiled undercover (three weeks) prior to being transferred into pugmill. This reduces moisture and therefore odour.</p>	<p>Raw composted manure –odour was subtle with earthy smell. As the manure has been composted (biologically broken down) it is less odorous than manure straight from the pens.</p> <p>No other odour detected associated with raw material as contained.</p> <p>Gypsum stockpile was located outside of covered area. Did not detect smell.</p> <p>Depending upon the wind, odour from the manure composting area was detected.</p>	Low
Pugmill	Pugmill and associated screw conveyors is located undercover. This reduces the possibility of the material becoming wet whilst on the screw conveyor	No odour detected	Low
Production of granulated spheres			
Transfer of material	Activities are contained within a shed	No odour detected	Low
	All chutes are enclosed with dust extraction system with air transferred to bagfilter before vented outside of building		
	Conditions such as temperature, feed rate, additive addition, conveyor utilisation are recorded by a SCADA system with alerts in place to identify issues with system		
Conditioning	Additives are added into the conditioner via piping	No odour detected	Low
	Temperature is controlled		
Granulator	Activities are contained within a shed	<p>Odour was subtle within 1 metre of opened section. When peering into open section could feel warm air. Unable to distinguish the smell, but the odour was different in character to the manure compost area and feedlot.</p>	Low
	Temperature is controlled		

Activity / source	Controls	Observations	Magnitude of odour emissions
Dryer	Dryer system is enclosed with a dry cyclone and recycled air handling system. The dry cyclone manages the particulates, and the air recycling system improves thermal efficiency and effectiveness and consistency of the drying process.	Odour was subtle standing directly under exhaust of Dryer 2. Unable to distinguish the smell, but the odour was different in character to the manure compost area and feedlot. Once away from direct exhaust could not detect odour from the exhaust.	Low
Bagging / loading of product			
Bagging area	Contained within shed	Bagging was not occurring at time of site inspection. However, given that the system is enclosed and the process the product has been through, it is unlikely that odour would occur from this activity.	Low
	Enclosed system for sieves, weigh conveyors, bucket elevators and silos.		
Product storage	Stored in enclosed bags	No odour was detected	Low

6. CONCLUSIONS

An odour risk assessment has been undertaken to address an Information Request received from Council regarding the organic manure processing facility as part of the Change Application (Other Change) to allow receipt of manure from other feedlots for composting at the Grassdale Feedlot. No other changes to the Grassdale Feedlot (including the organic manure processing facility) activities are proposed by this application.

A site inspection was conducted at the organic manure processing facility to observe operations, assess odour controls, and identify potential odour emission sources. During the inspection, only a subtle odour attributable to processing activities was detected, and only near the granulator and directly beneath the exhaust stack. The odour character differed from the odour associated with the external manure composting area.

This observation was expected, as the material being processed comprised of composted manure that had already undergone significant degradation and was therefore relatively low in odour. Given the substantial separation distance to the nearest sensitive receptors (greater than 5.9km), together with the presence of other odour sources from the feedlot, including manure stockpiles and feedlot operations, the risk of off-site odour impacts from the manure processing facility is considered low.