



# Amendment Notice

**Works Approval Number** W5632/2014/1

**Works Approval Holder** Westpork Pty Ltd

**ACN** 009 148 789

**Registered business address** Unit 1, 7 Foundry Street  
MAYLANDS WA 6051

**Date of amendment** 21/11/2016

**Prescribed Premises** Category 67A – Compost manufacturing and soil blending: premises on which organic material (excluding silage) or waste is stored pending processing, mixing, drying or composting to produce commercial quantities of compost or blended soils.  
Category 61 - Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated.

**Premises** Mindarra Farm Piggery  
Lot 10 on Diagram 80101  
Wannamal Road West  
GINGIN WA 6503  
Certificate of Title Volume 1931 Folio 299

## Amendment

The Chief Executive Officer (CEO) of the Department of Environment Regulation (DER) has amended the works approval in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice.

Date signed: 21 November 2016

**Agnes Tay**  
**Director Strategy and Reform**

*an officer delegated under section 20 of the Environmental Protection Act 1986 (WA)*

## Amendment Notice

This Notice is issued under section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the works approval issued under the EP Act for a prescribed premises as set out below. This notice of amendment is given under section 59B(9) of the EP Act.

## Amendment Description

Works Approval W5632/2014/1 was granted by DER on 31 March 2016 to allow works for the construction of a composting facility at the Mindarra Farm Piggery.

Following a review of the Decision Document, the CEO determined that the Works Approval was not appropriate as it was not consistent with DER's position on a number of issues. The Works Approval Holder was formally notified of the review by letter dated 11 April 2016.

As part of the review, the acceptance of liquid controlled wastes from outside the premises has been reassessed in relation to the composting operation. The proposal relies on all liquids being sourced offsite in the form of controlled (liquid) waste. The resultant environmental and public health risk for pathogens and contaminants from the acceptance of controlled (liquid) waste is considered to be high.

The decision-making is outlined in the attached Decision Report.

## Decision

This amendment is made pursuant to section 59(1)(a) and (d) of the EP Act, being an amendment to remove or vary any condition to which the works approval is subject, and redescribing the purpose for which the premises to which the works approval or licence applies are used.

A concurrent and more recent Licence Amendment (L5724/1993/11) determined that the requirement for the eastern most evaporation pond is required for the Bio-gas proposal and will not be utilised in the composting facility. Documentation supplied for the assessment of Work Approval W5632/2014/1 clearly demonstrates the "Water Balance Ponds" are designed for the evaporation of liquid waste however the composting process described refers to the direct application of liquid waste to the composting windrows. Consequently reference to the construction specification of three additional "Water Balance Ponds" is removed from the Works Approval and the evaporation pond has been removed from the premises map.

A Carbon to Nitrogen ratio of between 25 and 35 to 1 will be required to be maintained as a licence condition. The nature and final volumes of liquid waste to be received will be determined at the time of the licence application assessment in accordance with the *Environmental Standard: Composting*, which DER is finalising soon.

## Amendment History

Instrument	Issued	Amendment
W5632/2014/1	21/11/2016	Works Approval Amendment Notice 1 Works Approval amendment to include removal of construction requirements pertaining to three proposed liquid waste ponds.

## Amendments

1. Front page of the instrument is amended by the deletion of text shown in strikethrough below and insertion of the red text shown in underline below:

Category number	Category description	Category production or design capacity	Premises production or design capacity
61	Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated.	100 tonnes or more per year.	<del>50 000 tonnes per year.</del> To allow for the acceptance of controlled (liquid) waste

2. Table 1.2.2 is amended by the deletion of the text shown in strikethrough below:

Table 1.2.2: Works specifications	
Column 1	Column 2
<b>Infrastructure</b>	<b>Specifications (design and construction)</b>
1) Hardstand	<p>(a) The composting hardstand must;</p> <ul style="list-style-type: none"> <li>(i) be constructed to an area of 3.6ha (approximately 220m x 170m) as depicted in the Site Plan in Schedule 1; and</li> <li>(ii) be lined with 7mm bitumen emulsion primer seal overlaid by a 35mm thick layer of asphalt to provide a minimum 42mm thick bitumen seal; and</li> <li>(iii) be engineered and constructed so as to be capable of accommodating the weight and movement of materials, vehicles and equipment used in the production of compost and required to operate on the hardstand, without distortion, cracking or otherwise compromising the integrity of the liner or altering the permeability and</li> <li>(iv) have a minimum 1% drainage gradient to ensure the free drainage of all leachate to leachate collection infrastructure; and</li> </ul> <p>(b) The non-composting hardstand must:</p> <ul style="list-style-type: none"> <li>(i) Be constructed to an area of 2.3ha as depicted in the Site Plan in Schedule 1; and</li> <li>(ii) Will be constructed for the purposes of processing of green waste into mulch for use within the composting process, as well as for storing of finished compost, soil blending, and vehicle access, parking and office area.</li> <li>(iii) Will have a sand sub-grade compacted: <ul style="list-style-type: none"> <li>a) to 95% Maximum Dry Density (MMD);and</li> <li>b) overlain by a gravel sub base of 150mm thick compacted layer compacted to 95% MMD; and</li> <li>c) With an additional gravel base-course 100mm thick compacted layer compacted to 95% MMD.</li> </ul> </li> </ul>
2) Leachate collection infrastructure	<p>Leachate collection infrastructure that will collect all leachate from the composting hardstand and direct the leachate into the leachate dam must:</p> <ul style="list-style-type: none"> <li>a) Have an impervious (<math>1 \times 10^{-9}</math> m/s) kerb bunding of at least 150 mm high x 150 mm wide to prevent run-on and run-off of surface water, including a 1 in 20 year storm event (20 year average recurrence interval) of 72 hours duration; and</li> <li>b) Have a seal between the hardstand and any bund kerbing that is impervious (<math>1 \times 10^{-9}</math> m/s).</li> </ul>

**Table 1.2.2: Works specifications**

<b>Column 1</b>	<b>Column 2</b>
<b>Infrastructure</b>	<b>Specifications (design and construction)</b>
3) Leachate dam	<p>The leachate dam must be lined using a HDPE liner and must be constructed in accordance with the following specifications:</p> <ol style="list-style-type: none"> <li>a) A HDPE liner must have: <ol style="list-style-type: none"> <li>a. a minimum thickness of 1.55 mm with heat welded joints;</li> <li>b. All seams and joints made on site should be continuous. Panels of the liner should be overlapped by a minimum of 100 mm, prior to heat welding or mechanical jointing.</li> <li>c. have a permeability of less than <math>1 \times 10^{-9}</math> m/s; and</li> <li>d. be capable of maintaining that permeability for the working life of the pond.</li> </ol> </li> <li>b) Constructed to a capacity of 3,300 m<sup>3</sup>.</li> <li>c) Batter slopes for the liners on the sides of ponds must not exceed 1:3 vertical to horizontal elevation to ensure compaction and stability of the dam liner.</li> </ol>
<del>4) Three new Water Balance Ponds</del>	<p><del>The ponds will be lined with HDPE to the following minimum specifications:</del></p> <ol style="list-style-type: none"> <li><del>a) coefficient of permeability of less than <math>2 \times 10^{-10}</math> m/s (ASTM method D4716)</del></li> <li><del>b) minimum thickness of 1.00 mm <math>\pm</math>5%</del></li> <li><del>c) specific gravity of not less than 0.94 (ASTM method D1505)</del></li> <li><del>d) melt index of 0.05-0.30 grams in 10 minutes (ASTM method D1238, condition E 190/ 2.16)</del></li> <li><del>e) carbon black content of 2-3% (ASTM method D1603)</del></li> <li><del>f) minimum tensile strength at yield of 16 000 kN/m<sup>2</sup>, and 550 kN/m<sup>2</sup> at break (ASTM method D638, type IV 2)</del></li> <li><del>g) minimum elongation at yield of 10%, and 300% at break (ASTM method D638).</del></li> <li><del>h) Pond batters will be at a 30% gradient to prevent liner slippage.</del></li> <li><del>i) All seams and joints will be continuous and overlapped by a minimum of 100 mm prior to joining.</del></li> <li><del>j) Each pond shall be constructed to a capacity of 3,300 m<sup>3</sup>.</del></li> </ol>
5) green waste surge area	<p>For the surge green waste hardstand, located adjacent to the supplementary water balance ponds the following specification will apply:</p> <ol style="list-style-type: none"> <li>a) Sand sub-grade: In-situ sand subgrade will be graded and compacted to 95% MDD.</li> <li>b) Gravel base-course: A 150 mm thick layer of compacted gravel. Maximum particle size to be approximately 50 mm. Compacted to 95% MDD.</li> </ol>
6) Loading Ramp	<p>The loading ramp will be constructed such that:</p> <ol style="list-style-type: none"> <li>a) Have a 1.8 m high tabletop of 6 m width and 5 m length and will be constructed on top of the completed hardstand. The access ramp (to the loading ramp) will be an additional 10 m long.</li> <li>b) The loading ramp walls will be constructed with 350 mm wide mass limestone blocks, thickened to 1,140 mm wide at the base. Infill material will be locally sourced gravel, which will be laid and compacted progressively in 300 mm thick layers.</li> <li>c) The loading ramp will include a 'slip lane' of 5 m width to allow trucks to move off the main thoroughfare route. The slip lane will be surfaced with asphalt to protect the gravel pavement.</li> </ol>
7) Washout Bay	<p>The washout bay will be constructed such that:</p> <ol style="list-style-type: none"> <li>a) It will share a common (rear) wall with the loading ramp (1.8 m high).</li> <li>b) The other walls will be constructed with 350 mm wide mass limestone blocks or reinforced concrete equivalent. Side walls will be tapered from 1.8 m high to 0.6 m high.</li> <li>c) Achieve a permeability of less than <math>1 \times 10^{-9}</math> m/s.</li> </ol>

3. Condition 1.2.5 is added by insertion of the red text shown in underline below.

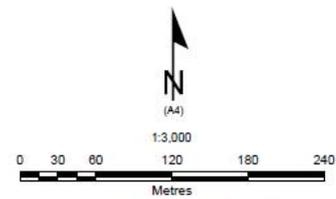
1.2.5 The Works Approval Holder must provide evidence of planning approval for the works at least 14 days prior to the commencement of the works.

4. The Premises map in Schedule 1 is replaced by the map below.



**W5632  
Approximate Premises Boundary**

Legend  
 Premises Boundaries



Projection: Universal Transverse Mercator  
 MGA Zone 50, Datum: GDA94



Produced by P. Rogoysky,  
 Department of  
 Parks and Wildlife



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## Review of Existing Premises

### Division 3, Part V *Environmental Protection Act 1986*

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<b>Applicant:</b>	Westpork Pty Ltd
<b>ACN:</b>	009 148 789
<b>Works Approval Number:</b>	W5632/2014/1
<b>File Number:</b>	DER2014/000625
<b>Premises:</b>	Mindarra Farm Piggery  Lot 10 on Diagram 80101 Wannamal Road West GINGIN WA 6503 Certificate of Title Volume 1931 Folio 299
<b>Date of report:</b>	Monday, 21 November 2016
<b>Status of Report</b>	Final

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## Definitions of terms and acronyms

Term	Definition
Application	The Works Approval application received 28 February 2014 by DER including additional supporting information received 7 February 2014 and 24 February 2015.
AS 4454	Australian Standard AS 4454–2012: Composts, soil conditioners and mulches
Category/Categories	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
Controlled Waste	Has the same meaning given to that term under the <i>Environmental Protection (Controlled Waste) Regulations 2004</i>
DER	Department of Environment Regulation
Decision Report	This document
Delegated Officer	An officer under section 20 of the EP Act
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
HDPE	High Density Polyethylene
MDD	Maximum Dry Density
The Premises	Composting Facility at Mindarra Farm Piggery on Lot 10 on Diagram 80101, Wannamal Road West, GINGIN WA 6503
Prescribed Premises	Premises prescribed under Schedule 1 to the EP Regulations
VOCs	Volatile organic compounds
Works Approval Holder	Westpork Pty Ltd

# 1. Purpose and Scope of Assessment

The Works Approval W5362/2014/1 (**Works Approval**) granted on 31 March 2016 for a composting facility and liquid waste facility for Westpork Pty Ltd (**Works Approval Holder**) at Mindarra Farm was brought to the attention of the Chief Executive Officer (**CEO**) on 6 April 2016. Following a review of the Decision Document, the CEO determined that the Works Approval was not appropriate and that the Works Approval required review and amendment. The **Works Approval Holder** was formally notified of the review by letter dated 11 April 2016.

This **Decision Report** sets out the findings of the review, and includes specific consideration of matters not considered in the original Works Approval.

## 2. Background

### 2.1 Existing Mindarra Farm Piggery

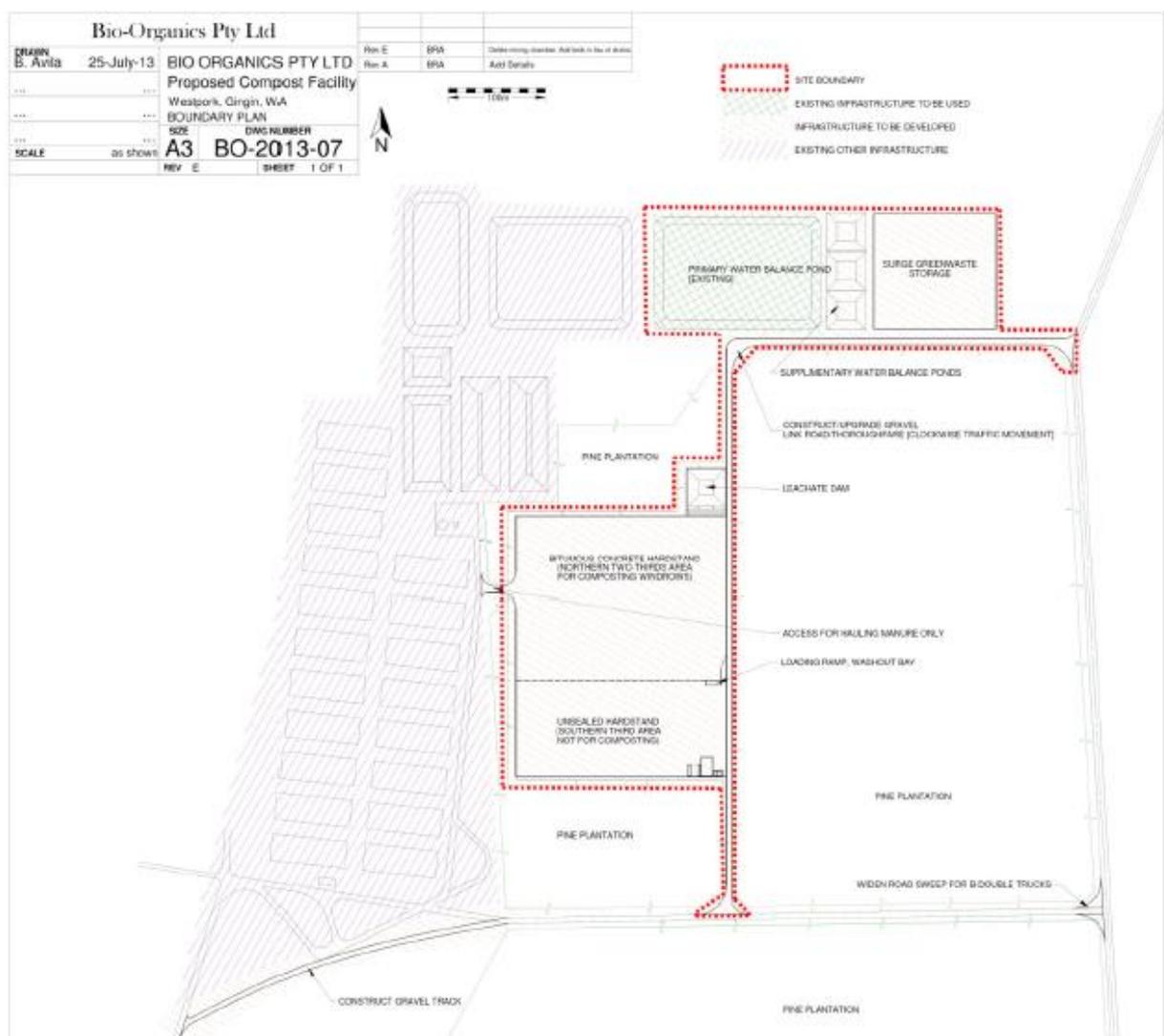
The Mindarra Farm Piggery (**the Piggery**) began operations in 1987 and is subject to a prescribed premises licence under Part V of the *Environmental Protection Act 1986 (EP Act)* (see Licence L5274/1993/11). The Works Approval Holder has held a licence for the Piggery since 1993. The Piggery consists of a combination of intensive conventional sheds and straw-based eco-shelters. The Piggery comprises of four separate areas. Each area is allocated to a different stage of operations as follows:

- Mindarra 1** - 950 sow breeder unit with pigs to three weeks of ages.  
Pig housing comprises four conventional sheds and converted deep litter sheds. Effluent handling consists of a combination of pull plug systems and flushing with recycled effluent from the pond treatment system.
- Mindarra 2** – Deep litter grow out unit  
Pig housing comprises of 120 deep litter shelters, holding 450 weaners and 225 finishers per shelter. In the process of being emptied with production moving to Mindarra 4.
- Mindarra 3** - 1,100 sow multiplier unit with some pigs kept until finisher age  
Pig housing comprises of four conventional sheds and three eco-shelters. Conventional sheds are flushed with recycled effluent to a three stage ponds system. Eco-shelters use straw for bedding, at the end of each batch of pigs, straw is removed and placed on a bunded compacted area before being moved for composting or alternatively exported off the farm site. There is an impervious bunded pad on the site of the anaerobic pond (1<sup>st</sup> stage pond) on which sludge is removed from the anaerobic pond and dried.
- Mindarra 4** - 55,000 intensive grow-out facility  
Pig housing comprising of 19 sheds when developed including 17 tunnel ventilated grower sheds, one controlled environment weaner shed and one sorting shed. Generally weaner sheds are flushed once a week and sheds with fully grown pigs are flushed every second day. Effluent from all sheds is collected in a concrete tank and pumped to the two screw press separators to remove a proportion of the solids. The solids are collected and moved to the compost bunded areas for composting or alternatively removed from the site. Liquid effluent from Mindarra 4 sheds is treated in a five pond system.

An existing composting facility exists within the Piggery (see 4.3.1 below for further details).

## 2.2 Works Approval Application

On 28 February 2014, **DER** received a works approval application (**the Application**) from Works Approval Holder for the construction of a composting facility and liquid waste facility adjacent to the Piggery (**the Premises**). The proposal was for the Premises to be operated as a separate entity with only shared power, amenity water and road access. Subsequent application supporting documents were received in June 2014 and November 2014. Additional supporting information was received 7 February 2014 and 24 February 2015.



**Image 1: Showing proposed Licence Boundary of the prescribed premises (image 6 Strategen 2014)**

The Works Approval was granted on 31 March 2016. Table 1 details the **Prescribed Premises Categories** and production quantities approved in the Works Approval. These capacities are lower than what was applied for; the throughputs which were approved in the Works Approval were consistent with the Shire of Gingin approvals, in accordance with DER's *Guidance Statement on Land use planning* (October 2015).

**Table 1: Prescribed Premises Categories**

Classification of Premises	Description	Production for Preceding Year	Schedule 1 Category Threshold
Category 67A	Compost manufacturing and soil blending: premises on which organic material (excluding silage) or waste is stored pending processing, mixing, drying or composting to produce commercial quantities of compost or blended soils.	80,000 tonnes per annum	1 000 tonnes or more per year
Category 61	Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is sorted, reprocessed, treated or irrigated.	50,000 tonnes per annum	1 000 tonnes or more per year

### 3. Composting Facility and Liquid Waste Facility Application

#### 3.1 Infrastructure

The Application from the Works Approval Holder proposed the construction of infrastructure for the composting facility under Category 67A, and liquid waste acceptance under Category 61. The infrastructure proposed to be constructed is detailed in Table 2 and with reference to the Site Plan (attached in the Works Approval).

**Table 2: Proposed Infrastructure (summary from the Application)**

	Infrastructure	Plan Reference
1	<p>Composting hardstand :</p> <ul style="list-style-type: none"> <li>• main hardstand area is 6ha. The composting area is a sealed bitumous hardstand limited to the northern part of the main hardstand (3.6ha) and specifically includes the following areas and criteria: <ul style="list-style-type: none"> <li>○ compost manufacturing area where: <ul style="list-style-type: none"> <li>▪ compost windrows are formed and regularly turned until the manufacturing process is complete;</li> <li>▪ manure and other putrescible wastes are mixed with green waste to form compost windrows; and</li> <li>▪ liquid waste is applied to compost windrows during the manufacturing process.</li> </ul> </li> <li>○ Pavement design and wearing course to be suitable for the operation of heavy machinery used in the compost manufacturing process;</li> <li>○ Surfaces are to be graded to direct surface water to perimeter catchment drains that will flow to the leachate pond;</li> <li>○ Collection and diversion drains located at the perimeter of the composting hardstand will be surface treated to</li> </ul> </li> </ul>	<p>Plan: Sealed bitumous concrete hardstand (northern two-thirds area for composting windrows) 220m x 170m</p>

	Infrastructure	Plan Reference
	<p>meet permeability requirements. Diversion drains for the composting hardstand will be restricted from vehicle traffic by the use of vehicle marker posts.</p> <ul style="list-style-type: none"> <li>○ Hardstand where composting will occur will be designed and constructed to achieve a maximum permeability of <math>10^{-9}</math>m/s.</li> <li>● The following specifications will apply: <ul style="list-style-type: none"> <li>○ Sand sub-grade: In-situ sand subgrade will be graded and compacted to 95% Maximum Dry Density (MDD).</li> <li>○ Gravel sub-base: A 150mm thick layer of compacted gravel. Maximum particle size to be approximately 50mm. Compacted to 95% MDD.</li> <li>○ Gravel base-course: A 100mm thick layer of compacted gravel. Maximum particle size to be approximately 50mm. Compacted to 95% MDD.</li> <li>○ A 7mm bitumen emulsion primer seal (fully impermeable membrane) overlaid by a 35mm thick layer of 10/75 asphalt (i.e. "intersection mix") to protect the bitumen seal: minimum 42mm thick bitumen seal and asphalt of 97% Marshall Maximum Density (MMD) to ensure the surface robust for heavy traffic.</li> <li>○ 1% grade north; 0.5% grade east.</li> </ul> </li> <li>● hardstands will be certified by an independent engineer to validate design, construction and permeability after completion, with validation by compaction tests, as-constructed survey and permeability testing.</li> </ul>	
2	<p>Concrete barrier kerb</p> <ul style="list-style-type: none"> <li>● perimeter concrete bunded kerb of composting hardstand.</li> <li>● to accommodate and control any leachate destined for the leachate dam.</li> <li>● 150mm high by 150mm wide.</li> <li>● laid on top of the bitumen to create an impervious seal.</li> </ul>	Plan: Concrete barrier kerb
5	<p>Surge green waste storage</p> <ul style="list-style-type: none"> <li>● for surge volumes of green waste (i.e. large amounts of green waste are received after large storms and often during spring).</li> <li>● area is located adjacent to the three small water balancing ponds.</li> <li>● a hardstand area for the purpose of temporarily storing green waste and will not be used for composting or any other processing.</li> <li>● stormwater from the supplementary hardstand will be directed to swale drains.</li> </ul>	Plan: Surge green waste storage

	Infrastructure	Plan Reference
	<ul style="list-style-type: none"> <li>Located adjacent to the supplementary water balance ponds.</li> <li>The following specifications apply: <ul style="list-style-type: none"> <li>Sand sub-grade: In-situ sand subgrade will be graded and compacted to 95% MDD;</li> <li>Gravel base-course: A 150mm thick layer of compacted gravel. Maximum particle size to be approximately 50mm. Compacted to 95% MDD; and</li> <li>1% grade west.</li> </ul> </li> </ul>	
6	<p>Primary water balance pond 1 (existing)</p> <ul style="list-style-type: none"> <li><b>HDPE</b> lined pond with a total volume of 50,000m<sup>3</sup> capacity already existing on site.</li> </ul>	Plan: Primary water balance pond #1 [existing]
7	<p>Supplementary water balance pond 1</p> <ul style="list-style-type: none"> <li>smaller plastic lined pond with a volume of approximately 3,300m<sup>3</sup>.</li> </ul>	Plan: Supplementary water balance ponds
8	<p>Supplementary water balance pond 2</p> <ul style="list-style-type: none"> <li>smaller plastic lined pond with a volume of approximately 3,300m<sup>3</sup>.</li> </ul>	Plan: Supplementary water balance ponds
9	<p>Supplementary water balance pond 3</p> <ul style="list-style-type: none"> <li>smaller plastic lined pond with a volume of approximately 3,300m<sup>3</sup>.</li> </ul>	Plan: Supplementary water balance ponds
10	<p>Leachate stormwater dam</p> <ul style="list-style-type: none"> <li>leachate pond with a volume of 3,300m<sup>3</sup>.</li> <li>adjacent to the composting pad.</li> <li>to collect any leachate and stormwater form the compost pad for eventual re-use on the compost or for dust suppression.</li> </ul>	Plan: Leachate stormwater dam (HDPE lined)
11	<p>Washout bay</p> <ul style="list-style-type: none"> <li>constructed to allow vehicles, after discharging their load into the composting rows, to have any residue safely washed out.</li> <li>a 32mm diameter poly pipe will provide water to the washout bay which will be manually operated with a tap and hose.</li> <li>a three sided bunker with its opening facing the sealed composting hardstand to ensure that any spillage or overflow is directed to the leachate pond.</li> <li>flat floor overlaid with the same profile as the composting hardstand, which will provide an impermeable surface.</li> <li>will share a common (rear) wall with the loading ramp (1.8m high).</li> <li>other walls will be constructed with 350mm wide mass</li> </ul>	Plan: Washout bay 5 x 16m

	Infrastructure	Plan Reference
	<p>limestone blocks or reinforced concrete equivalent.</p> <ul style="list-style-type: none"> <li>side walls will be tapered from 1.8m high to 0.6m high.</li> </ul>	
12	<p>Loading ramp</p> <ul style="list-style-type: none"> <li>constructed to provide elevated platform for machinery to allow the safe loading of trucks with finished compost and soil products.</li> <li>1.8m high tabletop of 6m wide and 5m length.</li> <li>constructed on top of completed hardstand.</li> <li>10m long access ramp.</li> <li>walls will be constructed with 350mm wide mass limestone blocks, thickened to 1,140mm wide at the base.</li> <li>infill material will be locally source gravel, which will be laid and compacted progressively in 300mm thick layers.</li> <li>will include a 'slip lane' of 5m width to allow trucks to move off the main thoroughfare route.</li> <li>the slip lane will be surfaced with asphalt to protect the gravel pavement and allow for ease of cleaning.</li> </ul>	Plan: Loading ramp 5m x 16m
13	<p>Overhead water filling tower</p> <ul style="list-style-type: none"> <li>with pump draw from dam.</li> </ul>	Plan: Overhead water filling tower (w/ pump draw from dam)
14	<p>Infiltration swale drain with sediment traps</p> <ul style="list-style-type: none"> <li>swale drains will include sediment traps to restrict movement of water from causing erosion or allowing silting of waterways.</li> <li>water collected in swale drains will be allowed to locally infiltrate into the sandy soil and/or be temporarily retained before discharge.</li> </ul>	Plan: Infiltration swale drain w/ sediment traps
15	<p>Unsealed hardstand (non-composting)</p> <ul style="list-style-type: none"> <li>Includes: <ul style="list-style-type: none"> <li>Green waste and mulching area; and</li> <li>Screening and finished product area.</li> </ul> </li> <li>limited to the southern part of the main hardstand (2.3ha).</li> <li>constructed for the purposes of: <ul style="list-style-type: none"> <li>vehicle access, parking and office area;</li> <li>storage and grinding of green waste;</li> <li>storing of finished compost; and</li> <li>soil blending to customer requirements.</li> </ul> </li> <li>non-composting hardstands would not require permeability to <math>10^{19}</math>m/s.</li> </ul>	<p>Plan: Unsealed hardstand (southern third non-composting) 220m x100m</p> <p>Plan: Green waste and mulching area</p> <p>Plan: Screening and finished product area</p>

	Infrastructure	Plan Reference
	<ul style="list-style-type: none"> <li>• stormwater runoff from non-composting hardstand will be directed to swale drains.</li> <li>• the following specifications will apply: <ul style="list-style-type: none"> <li>○ Sand sub-grade: In-situ sand subgrade will be graded and compacted to 95% Maximum Dry Density (MDD);</li> <li>○ Gravel sub-base: A 150mm thick layer of compacted gravel. Maximum particle size to be approximately 50mm. Compacted to 95% MDD;</li> <li>○ Gravel base-course: A 100mm thick layer of compacted gravel. Maximum particle size to be approximately 50mm. Compacted to 95% MDD; and</li> <li>○ 1% grade south; 0.5% grade east.</li> </ul> </li> </ul>	

In addition to the infrastructure detailed in Table 2, the non-fixed plant proposed to be used is summarised in Table 3 below.

**Table 3: Proposed Non-fixed Infrastructure (summary from the Application)**

	Non-fixed plant
1	Compost turner (self-propeller, high-speed drum turner) to aerate compost windrows
2	Frontend loader for materials handling, loading, etc.
3	Excavator for materials handling, loading, shaping windrows etc.
4	Bobcat for housekeeping and keeping the compost pad clean
5	Water cart for dust control and applying water to compost rows
6	Trucks for carting material in and out of the facility (various sizes and configurations)
7	Grinder for processing green waste prior to forming windrows or manufacturing specific-size mulches
8	Screen for processing finished compost into specified particle sized product

## Operational Aspects

The Application specified that Bio-Organics Pty Ltd will be the operator of the composting and liquid waste facilities. Bio-Organics have entered into an exclusive contractual relationship with the Works Approval Holder as their tenant to operate the proposed compost facility (and associated waste management services).

Upon operation, the Application specified that the activities of the Works Approval Holder and Bio-Organics would be independent from each other, except for:

- some shared access roads;
- shared power and water supply;
- the movement of pig manure, sludge and pig carcasses from the Piggery to the compost facility; and
- the transfer of a disused evaporation pond for use in the compost facilities liquid waste treatment process (this is at variance with Licence Application L5724/1993/11 which specifies the pond as part of the Biogas wastewater treatment train).

Key features of the operations of the Premises as described in the Application are summarised in Table 4 below:

**Table 4: Summary of operations (summary from the Application)**

	Operational features
1	<p>Composting</p> <ul style="list-style-type: none"> <li>• Inputs/ingredients are received in bulk form from commercial processes.</li> <li>• Compost ingredients (solid and liquid wastes [see row 2 below]) are added to new and active compost rows as the ingredients arrive at the facility (see Table 5 below for a summary of feedstock). All solid waste ingredients (other than green waste) to be composted will be handled in a <i>just-in-time</i> manner to avoid storing of ingredients on areas other than the impermeable compost area, where possible.</li> <li>• A new composting windrow is formed on the sealed composting pad as solid ingredients are mixed and the row is lengthened from north to south.</li> <li>• For each full-length windrow, liquid waste is applied at regular intervals at a rate of approximately 10% w/w every seven days to ensure composting maintains an ideal moisture content of between 30% and 60%.</li> <li>• The compost rows will be monitored daily at regular (spatial) intervals for moisture content.</li> <li>• If the moisture content is below or approaching 30%, liquid waste will be applied to ensure the moisture remains in the ideal range (see 2 below).</li> <li>• Processing of green waste into mulch is to be pasteurised according to the method prescribed by <b>AS4454</b> Clause 2.3.1.</li> <li>• Final composting product will be trucked off-site.</li> </ul>
2	<p>Liquid Waste</p> <ul style="list-style-type: none"> <li>• Liquid waste ingredients are applied directly from tankers into composting windrows by the gravity discharge into channels formed in the windrow.</li> </ul>

Operational features	
	<ul style="list-style-type: none"> <li>• Liquid waste will be treated using the following process on site: <ul style="list-style-type: none"> <li>○ Liquid waste used in the compost process will be managed by discharge into compost windrows, which will then be mixed to capture and absorb the liquid.</li> <li>○ Liquid waste buffering capacity will be needed to manage short term excess in liquid waste volumes received.</li> <li>○ Liquid waste that exceeds the immediate needs of the compost and is suitable for future use in composting by having a very low percentage of solids (e.g. stormwater) will be discharged to the water balancing ponds.</li> <li>○ More odorous liquid waste will be given preference for transfer to the composting process than less odorous wastes.</li> </ul> </li> </ul>
3	<p>Soil Blending</p> <ul style="list-style-type: none"> <li>• Soil blending as defined under Category 67A will be used only for final blending of the compost to make the finished compost product.</li> </ul>

The proposed types and quantities of feedstock used at the Premises are detailed through Table 5 below:

**Table 5: Proposed types and quantities of feedstock (summary from the Application)**

Waste Type	Description/ Examples	Quantity
Shredded green waste	n/a	up to 60,000 tonnes per annual period
Nitrogenous solid waste	<p>Wastes that are compostable such as foodstuffs, vegetable matter, manure, malting sludge, other food wastes, spoiled fertilisers etc.</p> <p>Pig manures from other facilities are not permitted to come onto the premises for bio-security reasons and to protect the health of the Westpork herd. Manures and pond sludge from the Westpork herd shall be the only pig matter entering the composting facility.</p>	Up to 20,000 tonnes per annual period
Benign solid waste	Non-biodegradable wastes, which are beneficial for soil. These wastes include bentonite clays, plasterboard and other minerals such as clays, granite dust and gypsum to create a soil mix to suit a particular specification.	Up to 10,000 tonnes per annual period
Blending ingredients that are not composted	These include soil, peat, sand and sawdust sourced from local quarries and suppliers for the purpose of creating soil mixes when blended with compost.	n/a

Waste Type	Description/ Examples	Quantity
Nitrogenous liquid waste	<p>Bulk liquids comprised of predominantly water that contain biodegradable contaminants that are non-toxic, digestible by compost organisms and do not contain elevated concentrations of heavy metals, hydrocarbons, salts or pesticides. These include grease trap, pond water, stormwater, and some wash down water from industry processes (i.e. from the cleaning of trucks and earthmoving equipment).</p> <p>Other wastewater suitable for composting shall be either directly applied to a composting row or diverted to ponds for recycling during summer. These include untreated grease trap, saline water, and some wash down from industry processes</p>	Combined liquid waste total of 100,000 tonnes per annual period
Other liquid wastes	Other liquid wastes beneficial for plant health after composting such as phosphoric acid and wool scouring wastes.	

The proposed controlled (liquid) waste types proposed to be used at the Premises are detailed through Table 6 below:

**Table 6: Proposed controlled (liquid) waste types (summary from the Application)**

Category Group	Waste Code	Waste Type	Maximum total volume intake
B – Acids	B100	Acid solutions or acids in solid form	1%
C – Bases	C100	Bases solutions or alkalis in solid or liquid form	1%
D – Inorganic Chemicals	D300	Non Toxic Salts	5%
K – Putrescible and Organic Wastes	K100	Animal effluent and residues	2%
	K110	Wastes from grease traps	80%
	K190	Wool scouring wastes	10%
	K200	Food and beverage processing wastes	10%
L – Industrial Waste Water	L150	Industrial wash waters contaminated with a controlled waste	10%
M – Organic Chemicals	M250	Surfactants and detergents	5%

## 3.2 Controlled (liquid) waste

The Works Approval Holder claims that controlled (liquid) waste is required for the composting facility for the following reasons:

1. *The existing Westpork Rights in Water and Irrigation Act 1914 water licence is insufficient to meet the needs of the proposed composting operations as the full allocation is used within the existing piggery operation. The waste supply for the composting operation will be entirely sourced from imported wastewater (page 7 of January 2014 application and detailed on page 18 of supporting information 24 February 2015);*
2. *The composting process has a high capability to 'treat' wastewater by using it to support the composting process. The addition of liquid waste also ensures suitable moisture content in the finished product (page 19 of application, November 2014); and*
3. *The primary moisture input is in the form of bio-activating liquid wastes, such as grease trap waste. These wastes activate and accelerate the composting process through addition of nitrogenous substances that act as a microbial accelerator of the composting process, allowing for product to be manufactured more quickly. Liquid waste is significantly more beneficial to the composting process than clean water, because of its bio-activation capability. The admixture of nitrogenous liquid waste and green waste in a well-managed composting system is an ideal way to manage such waste (page 17 of application, November 2014).*

The Works Approval Holder claimed the following in relation to the use of controlled (liquid) waste:

*"There are potentially thousands of different solid and liquid wastes that can be composted. Only those that improve the compost process, are easily bio-degraded and benefit the end-product are accepted into the facility. Only the controlled wastes included in Table 2 (Table 6 in the decision report) will be accepted into the process. No more waste than that that can be processed in a timely manner will be accepted by the facility" (page 21 of application, November 2014).*

The Delegated Officer considers that it has not been sufficiently demonstrated whether all the controlled (liquid) waste listed in Table 6 (further confirmed in correspondence on 10 October 2016 from Westpork) is of the benefit to the end product other than solely providing moisture.

The Delegated Officer notes that DER is finalising the *Environmental Standard: Composting* (ES: Composting) and that the volume and type of untreated liquid waste which may be accepted as a feedstock will be determined at the time of the licence application assessment in accordance with the final ES: Composting.

### 3.2.1 Wastes from grease traps

The Delegated Officer notes that grease trap waste (representing about 80% of maximum total volume intake) was originally proposed to be treated through a grease trap waste separator followed by dissolved air floatation (DAF) separator plant to remove lipids. The Works Approval Holder subsequently clarified this through correspondence on 1 August 2016, stating that:

*“Grease trap wastes is proposed to be added to the compost rows as they arrive on site removing the need for a requirements for the DAF separator for the management of these wastes prior to integration within the compost”.*

The Delegated Officer has taken into consideration the absence of treatment of grease trap waste and that this is due to grease trap waste being directly applied to the compost rows. Further the Delegated Officer notes that this waste type represents 80% of all controlled (liquid) waste types intended to be accepted at the Premises.

### **3.2.2 Carbon to Nitrogen ratio**

The Delegated Officer considers that the maintenance of a suitable carbon to nitrogen (C:N) ratio is required to adequately control the risk from odour and ensure product quality. The C:N ratio is critical for the production of quality compost. Section 5.1.1 of the Application states:

*“a ratio of 4:1 of raw ingredients has been found to be more than satisfactory to reduce odour generation.”*

This was further clarified by the Works Approval Holder through correspondence on 1 August 2016, which provided a review on the potential and industry C:N ratio's for composting. The following statement was provided:

*“In summary, the 4:1 ratio discussed in the application is not proposed C:N ratio, but rather the mix of green waste to manure. It is recognised that appropriate C:N ratios are in the order of 25-30. Feedstocks from each source or aggregated supplies will be tested prior to ingress to assist in defining a C:N ratio for each ingredient which will be used to determine a composition that provide the requisite starting C:N ratio of the windrow”.*

The Delegated Officer has determined that additional operational control in the form of licence conditions may be required to maintain optimal C:N ratios to control odour and ensure product quality.

### **3.2.3 Water supply and cross contamination**

The Delegated Officer accepts that an insufficient water supply for the purposes of composting exists at the Premises and notes that the lack of quality water available at the Premises may affect the finalisation of the composting product. Reviews of similar composting facilities which use liquid waste in their processes indicate that quality water (not controlled (liquid) waste water) is used in final composting stages.

The Works Approval Holder outlined the proposed composting process and maturation phase which will be undertaken at the Premises and is shown through Figure 1. The Delegated Officer notes that the application of controlled (liquid) waste is not proposed to occur after the final treatment steps.

The Delegated Officer considers that cross contamination of composting products which have already undergone thermophilic biological transformation must not occur at the Premises. This would occur through the retreatment (recontamination) of controlled (liquid) waste, or recycled water at the final stages of the composting process.

The Delegated Officer notes without another proposed water source or process control definition, it is possible that recycled water that has come into contact with liquid waste and treated compost will be utilised. In addition a clear pathway and receptor has been identified in that an intended market is the home user (small domestic market) (as described under section 4.2 of application, November 2014).

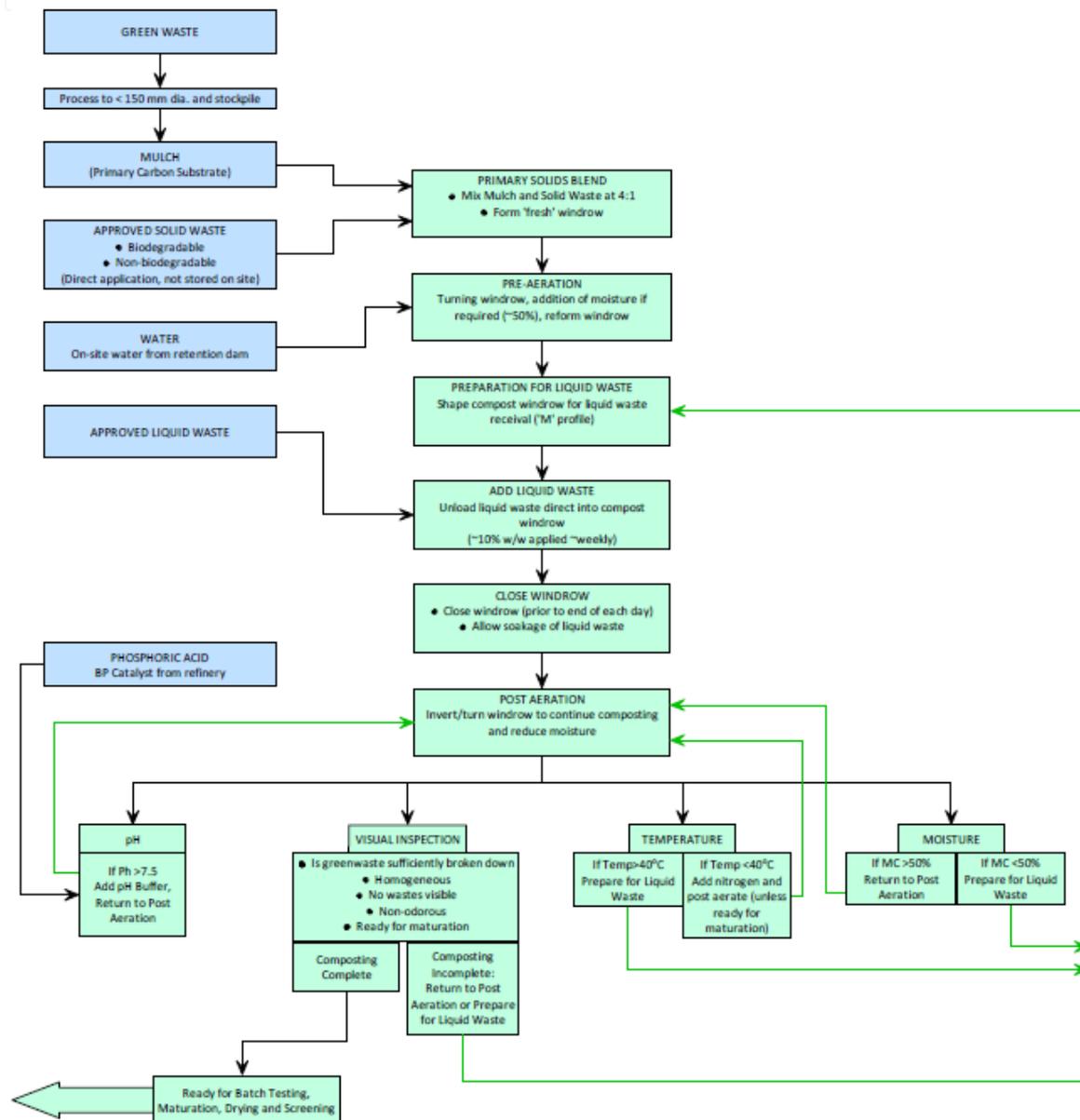
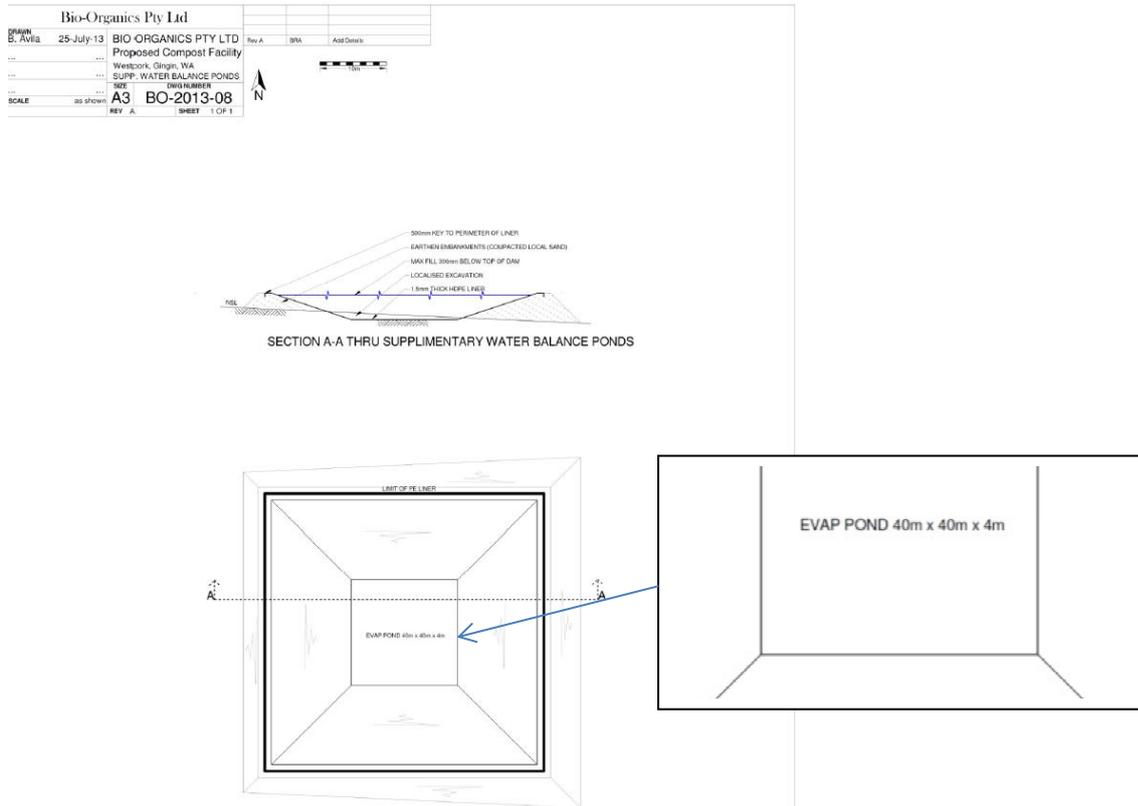


Figure 1: Processing and Compliance testing (page 43 of Application, November 2014)

### 3.2.4 Storage of controlled (liquid) waste

A pond system was proposed to store liquid waste at the Premises and included a leachate pond adjacent to the compost pad, a primary water balancing pond (existing) and three supplementary water balance ponds.

A review of the supplementary water balance drawings (BO-2013-08, page 38 of application, November 2014) clearly specifies the pond design being evaporation. The pond design is shown below through Figure 2.



**Figure 2: Design drawings of supplementary water balance ponds**

The Delegated Officer notes that the pond design is to act as an evaporative pond and not as a storage pond. It is considered the use of an evaporative pond may result in the loss of excessive moisture at the Premises resulting in high nutrient and organic loads in the remaining liquid waste in the ponds. In addition it is understood that the storage of controlled (liquid) waste should not be required given that it is intended to be applied when received directly to composting windrows.

The Delegated Officer has undertaken a detailed risk assessment of the use of controlled (liquid) wastes and the key matters identified in this section in the composting process (see Section 8).

**Key Findings: The Delegated Officer has reviewed the information regarding controlled (liquid) waste and has found:**

1. Grease trap waste is not proposed to be treated prior to use and is intended to be directly applied to compost as it arrives at the Premises.
2. Excessive ratios of grease trap waste may degrade microbial performance.
3. Supplementary water balance ponds detailed as “evap ponds” may by design cause excessive moisture to be lost from the stored liquid wastes, retaining high levels of nutrients and causing further uncertainty in the management of the C:N ratio and ultimately compost quality.
4. The use of “evap ponds” is inconsistent with the operational process which has been described as direct application to composting windrows.

5. The lack of “quality water” available (page 40 application, November 2014) on site may affect the quality of the composting product and re-contaminate the composted materials, posing a high risk to intended small retail users.
6. The volume and nature of controlled (liquid) waste to be received at the Premises will be assessed at the time of the licence application and in accordance with the *Environmental Standard: Composting*.

## 4. Legislative Context

### 4.1 Prior approvals

The Works Approval Holder first obtained a Planning Approval and Offensive Trade Licence (under the *Health Act 1911*) for a composting facility in 1997. The Offensive Trade Licence has been renewed annually and remains current. The composting facility is the subject of the Offensive Trade Licence and must adhere to Part 9 of the *Shire of Gingin Health Local Laws 2004* which includes general requirements relating to:

- cleanliness; including keeping the premises free from any unwholesome or offensive odour arising from the premises;
- rats and other vectors of disease;
- effluvia, vapours, gases or dust; and
- storage of materials.

### 4.2 Planning Approval

The site is located within Shire of Gingin Local Planning Scheme No. 9 District Zoning Scheme. Planning approval for an extension to composting facility on Lot 10 Wannamal Road West, Boonanarring was granted on 24 December 2013 (see Appendix 1).

The approval was for an extension to the existing composting facility and was subject to the following conditions:

1. *the land use and development shall be undertaken in accordance with the approved plans unless otherwise conditioned in the Approval;*
2. *the development shall comply with the definition of Composting Facility as follows:*  
*“premises on which organic material (excluding silage) or waste is stored pending processing, mixing, drying or composting to produce commercial quantities of compost or blended soils”.*
3. *the Approval is for an extension to the existing Composting Facility only. Hence, all liquid waste taken must be related to and used in the composting activities on the site; and*
4. *negotiations are to be undertaken with the Applicant with respect to a contribution for the up-grading of the unsealed portion of Wannamal Road West to the eastern boundary entrance to the Westpork facility prior to the commencement of the development, to the satisfaction of the Chief Executive Officer.*

*Note 1: If the development, the subject of this approval is not substantially*

*commenced within a period of 2 years or such other period as specified in the approval after the date of the determination the approval shall lapse and be of no further effect.*

The planning approval was based on the acceptance of between 30,000 - 50,000tpa volume of liquid waste (page 8 of Appendix 1).

The Shire of Gingin advised DER on 26 May 2016 that the planning approval for the Application has lapsed:

*An inspection of the property on 25 May 2016 confirmed that work in respect to the construction of a compost facility has not substantially commenced and therefore the application has lapsed.*

**Key Findings:**

- 1. The Delegated Officer has found that at the time the Works Approval was granted, the planning approval had lapsed.**
- 2. Planning Approval was for the acceptance of between 30,000 - 50 000 tonnes per annum of Liquid Waste.**

## 4.3 Part V of the EP Act

### 4.3.1 Previous Works Approvals

Table 8 shows the Works Approvals granted in relation to the Piggery.

**Table 8: Past Works Approvals for the Piggery**

Works Approval	Date of Issue
W958/1993/1	16 June 1993
W2097/1997/1	19 September 1997
W3208/2000/1	18 October 2000
W3861/2004/1	19 January 2004
W4209/2006/1	16 May 2006
W5087/2011/1	9 February 2012
W5632/2014/1	31 March 2016

Works Approval W2097/1993/1 and W3861/1993/1 related to the construction of the existing composting manufacturing facility and associated drainage activity at the Piggery. These Works Approvals allowed for the construction of a 30,000 tonne per annum compost manufacturing facility as a means of composting piggery waste. Category 67A was not added to the Licence as the Licence Holder operated below the throughput threshold.

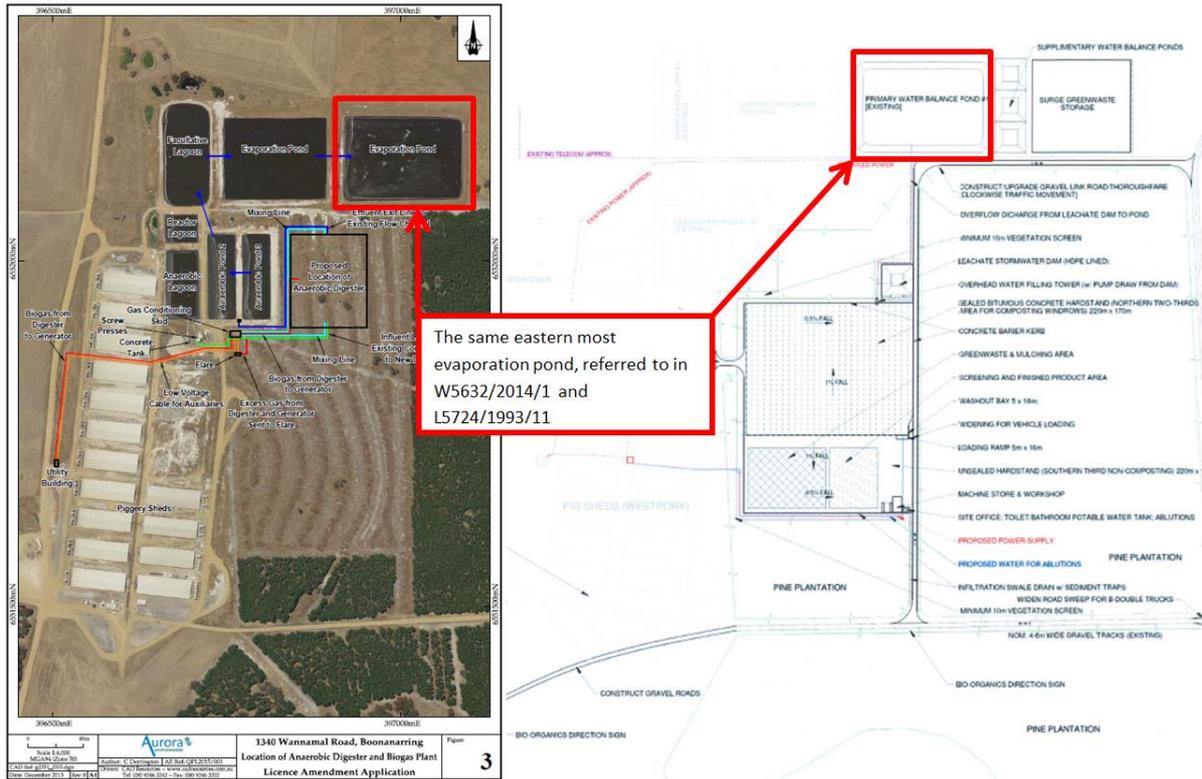
### 4.3.2 Licence history

The current Category 02 – Intensive Piggery Licence L5274/1993/11 was granted on 31 May 2012 without a Decision Document or Environmental Assessment Report. The assessed throughput for Units 1, 3 and 4 is 65,000 pigs at any one time.

The Licence includes conditions pertaining to:

- wastewater treatment and disposal;
- wastewater treatment ponds;
- wastewater irrigation;
- monitoring requirements including:
  - monthly maximum no. of pigs held on-site at each piggery unit;
  - cumulative volume of wastewaters discharged to each irrigation area;
  - volume of treated wastewater recycled for shed flushing; and
  - wastewater quality.
- carcass disposal;
- wastewater pond desludging;
- sludge drying and temporary storage;
- storage of straw-based manure; and
- disposal of solid sludges and straw-based manure.

The Works Approval Holder submitted an application to amend Licence L5724/1993/11 on 14 December 2015 to include a new emission point associated with the construction and operation of a covered anaerobic pond and Biogas plant. The application for the Piggery licence is currently under assessment by DER. The application for the Piggery licence indicates that the evaporation pond proposed to be used in the composting facility as defined by Works Approval W5632/2014/1 is required for the operation of the Biogas facility.



**Image 2: Showing the eastern most evaporation pond being required for both the Composting Facility Works Approval and the Piggery Licence amendment application.**

**Key Finding:**

1. The Delegated Officer has found that the Works Approval (W5632/2014/1) and the later Licence Amendment (L5724/1993/11) are inconsistent in the proposed use of the eastern most evaporation pond (primary water balancing pond).
2. The primary water balancing pond has a capacity of at least 50,000 m<sup>3</sup>.
3. As the Piggery Licence amendment application documentation was submitted subsequent to the Application, the Delegated Officer considers that the primary water balancing pond is no longer available for liquid waste storage described within the Application for the Works Approval.
4. In any event, the Delegated Officer considers that the use of the primary water balancing pond for liquid waste storage is inconsistent with the operational process which has been described as direct application to composting windrows.

### 4.3.3 Modelling and monitoring data

#### Groundwater Investigation

On behalf of the Works Approval Holder, Strategen undertook an investigation of the potential shallow ephemeral perched water tables in the locality in September 2014. The investigation involved drilling four boreholes to a depth of 15 metres at locations around the proposed composting facility.

One drill site intersected groundwater at 15 metres below ground level (mbgl), the other three being dry. The investigation found:

- Groundwater inflow occurred very slowly to the bore and the small quantity of water that could be extracted with a stainless steel bailer, indicated a low permeability aquifer consistent with clayey sand.
- Several waterbodies are present on the Works Approval Holder's premises, particularly to the north and north-west of the site, with one to the south. All, with one exception were soaks excavated for the purpose of providing stock water. The exception being a borrow pit for material to provide banks to lined ponds present on the site. These water bodies are ephemeral and appear to reflect an ephemeral shallow aquifer system.
- A sand quarry to the northeast of the proposed composting facility site was excavated to a depth of approximately five to six metres and was dry; indicating the shallow aquifer system did not extend to this area.
- That the water table is local, limited in area and not associated with supporting any environmental features (at page 2 of the investigation). These findings were supported by the results from these bores, observations of the dry sand quarry to the northeast of the site and lack of any natural wetland areas in the site vicinity.

The assessment of groundwater is set out in Section 7 of this report.

### 4.3.4 Clearing

Construction of the Premises will require clearing of about six hectares of pine plantation, which forms part of a larger block occupying the site. Some remnant vegetation exists in other areas of the premises which will not be disturbed. Pine trees are not considered native vegetation and therefore are not protected under the EP Act. As such, a clearing permit is not required for the proposal.

## 5. Assessment of Operator

The Works Approval decision document noted that "it is uncertain whether the licence will be granted to Westpork or [Bio-Organics Pty Ltd], as the occupier of the site".

The Works Approval decision document provided that as part of the licence application assessment for the composting facility, DER will undertake an internal due diligence of the Applicant's fitness and competency based on DER's compliance records.

DER has completed its assessment of Bio-Organics as the potential operator of the composting facility, as proposed in the Application. This assessment has been provided in a separate report to Bio-Organics.

## 6. Consultation

DER referred the Application to the Shire of Gingin on 2 April 2014.

DER also publically advertised the Application in the West Australian newspaper 4 April 2016 and did not receive any submissions.

DER contacted the Shire of Gingin on 28 April 2016 in regards to the status of the planning approval for the proposed composting facility at Lot 10 Wannamal Road West, Boonanarring. The Shire of Gingin provided a response on 26 May 2016 (see section 4.1).

## 7. Location and Siting (Potential Receptors)

### 7.1 Siting Context

The Premises are located on Wannamal Road West, Gingin, approximately 10 km east of Brand Highway and 90 km north of Perth. The lot consists of 310 hectares of General Rural Zoned land currently used partly for a piggery and a pine tree plantation.

The predominant surrounding land use is a State Forest or uncleared native vegetation (north, east and south) and a Shire of Gingin gravel pit on rural land to the west. There are no dwellings or public or private activity within the immediate area. Boonanarring Nature Reserve (Crown Reserve 41805) is located on the southern side of the Wannamal Road.

The Premises are predominantly cleared with some areas of residual native vegetation and a block of approximately 45 hectares of pine trees plantation immediately east of the new sheds and immediately south of the evaporation ponds. The proposed composting facility will be sited within this pine plantation, immediately east of the Piggery.



**Figure 3: Location of the Premises in relation to sensitive receptors. Premises coloured in pink.**

## 7.2 Residential and Sensitive Premises

The distances to residential and sensitive receptors are as follows:

**Table 9: Receptors and distance from prescribed activity**

Residential and Sensitive Premises	Distance from Prescribed Activity
Rural-residential dwelling 1	3,700 m to the west
Rural-residential dwelling 2	7,000 m to the west
Oil/Gas Mining Operation	8,700 m to the west
Town of Gingin	20,000 m to the south-west

## 7.3 Specified Ecosystems

As identified in Table 10 below, there are several soaks excavated for stock water supply that represent winter water tables within several metres of the land surface and a sand quarry. The Works Approval Holder has submitted that the soaks appear to dry out in the summer and reflect some ephemeral groundwater perching at these sites.

**Table 10: Specified ecosystems**

Specified ecosystems	Distance from Prescribed Premises
Soak 1 - Resource Enhancement Dampland	Less than 700 m to the south-west Resource enhancement management category
Soak 2 - Conservation Category Dampland	Less than 1,300 m to the north-east Conservation management category
Soak 3 - Multiple Use Sumpland	Less than 2,000 m to the south-west Multiple use management category
Carnaby's Black-Cockatoo*	Potential foraging and roosting habitat within the pine plantation to be cleared for the Composting facility.

### Carnaby's Black-Cockatoo\*

The Carnaby's Black-Cockatoo is listed as a threatened species under the *Wildlife Conservation Act 1950* and endangered under the *Environmental Protection and Biodiversity Conservation Act 1999*. The species has the potential to be affected indirectly by the proposed facility as a result of clearing a six hectare area of pine plantation.

The Works Approval Holder has provided that the pine plantation is likely to provide foraging and roosting habitat for the species.

The area of pines to be cleared is contiguous with a substantially larger area of pines and with extensive areas of adjacent native vegetation that would provide similar foraging habitat, as such, the area to be cleared is not considered to be 'critical habitat' with respect to the potential effect of the project on the existence of the species and its distribution.

## 7.4 Groundwater and water sources

The Premises overlies the Perth Basin, which is a major sedimentary basin that lies west of the Darling Range extending from around Geraldton to the south coast. It contains significant aquifers of fresh groundwater primarily recharged by direct infiltration of rainfall. The Premises are located within the Department of Water proclaimed Gingin Groundwater Area. However the site is located on the Dandaragan Plateau area of the Basin, which is substantially less prospective for fresh shallow groundwater than much of the Perth basin. In this area, the significant groundwater resource (Leederville formation) is likely to occur at depths of more than 100 metres.

DER's Principal Hydrologist reviewed drilling logs submitted by the Works Approval Holder and advised that these indicate that the shallow sand unit will form an ephemeral perched aquifer that will only contain significant amounts of water during intense rainfall events. During intense rainfall events, it is likely that water will flow in this sand unit (perched aquifer) towards the south-east and discharge as springs and seep where there is a change of slope on hillsides.

The Works Approval Holder advised that there are no watercourses on the Premises. The Premises are located within two hydrological catchments; the Swan-Avon and the Moore River. The majority of the Premises is within the Swan-Avon catchment with the Brockman River system approximately 6.1km from the Premises. Red Gully Creek is the nearest system; it is however outside the catchment of the composting facility.

**Table 11: Groundwater and water sources**

Groundwater and water sources	Distance from Premises	Environmental Value
Groundwater is considered brackish (Between 1,000 to 1,600mg/L Total Dissolved Solids)	<p>Groundwater in the area is indicated at depths of at least 60mbgl.</p> <p>A perched water table may be present at 15mbgl (see section 4.3.3)</p> <p>Five groundwater bores are located within the premises boundary, Four of which are owned by Westpork (based on available GIS dataset – WIN Groundwater Sites). Westpork is licensed to abstract from three bores on the site, with an allocation of 379,850kL of water per annum, under DoW Licence Number 60381.</p> <p>There are no Water Corporation Production bores within 1km of the premises.</p>	Classified as non-potable, abstracted groundwater is used in the Piggery operations.

## 7.5 Other site characteristics

The topography of the site is predominantly flat with an average RL varying from 195.0 to 210.0 AHD. An elevated hill is located on the mid-west side up to 239.0 AHD.

There are no areas of significance other than State Forest which adjoins the Premises on the northern and eastern boundary.

## 7.6 Soil Type

The site consists of varied soil types. Generally, the lower areas to the east have a Karrakatta Formation yellow sand type, while the elevated soil to the west is lateritic clay and gravel.

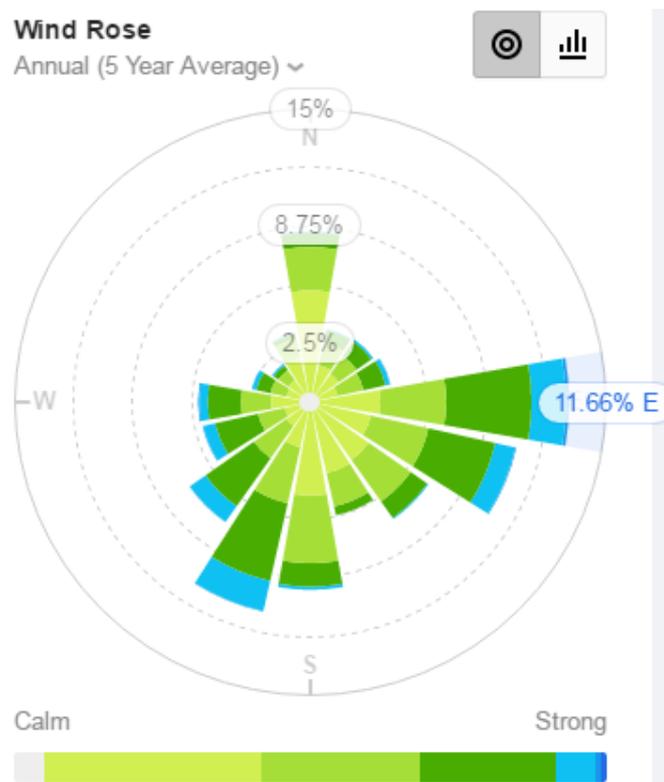
Stratigraphic logs from five bores located in the vicinity of the proposed composting facility were obtained from the DoW WIN database. The bores were drilled into the Leederville formation to depths between 128 and 144mbgl, and generally show a stratigraphy comprising sand and gravelly sands within the upper few metres, progressing into various sandy clays and clays, with siltstones, shales and sandstones at depth.

## 7.7 Meteorology

### 7.7.1 Wind direction and strength

Wind roses generated using meteorological data from Gingin Airport are presented below.

Figure 4 shows the annual wind rose based on the five year average annual wind direction and strength.



**Figure 4: Wind Rose, Gingin Airport based on 2011-2016 annual average**

*(Sourced from [wind.willyweather.com.au](http://wind.willyweather.com.au) on 11 May 2016)*

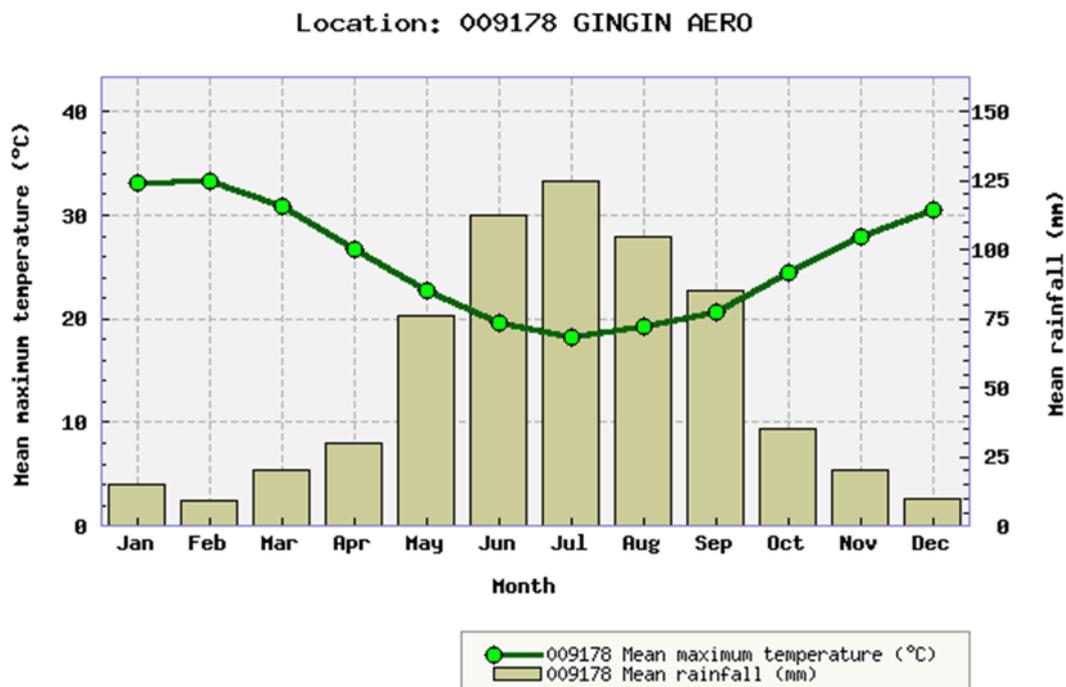
It is important to note that this wind rose shows historical wind speed and wind direction data at the Gingin airport weather station and should not be used to predict future data.

## 7.7.2 Rainfall and temperature

The region experiences hot dry summers and cool wet winters. The average January temperature is 24.9°C and the average July temperature is 12.8°C. Rain falls mostly in the cooler months, from May through to August and annual evaporation rates exceed rainfall. Summer thunderstorms and remnant tropical cyclones can cause isolated and heavy rain, resulting in local flooding.

The nearest Bureau of Meteorology climate station to the project area is at Gingin (approximately 17km south of the site). Mean monthly maximum temperatures at Gingin range from 33.2°C in January to 18.3°C in July and mean minimum temperatures range from 17.1°C in January to 6.2°C in July.

Mean monthly rainfalls vary from 9.5mm in February to 124.9mm in July. Mean annual rainfall is 620.2 (BOM 2016). Annual evaporation is approximately 2,200 mm (Department of Agriculture 1987).



Created on Thu 5 May 2016 18:15 PM AEST

Figure 5: Mean temperature and rainfall Gingin airport

## 8. Risk Assessment

### 8.1 Assumptions

The risk assessment has assumed that all the liquids used in the composting process will be controlled (liquid) wastes, as proposed by the Works Approval Holder. It is assumed that there will be no balancing storage due to the Delegated Officer's findings regarding the use of the existing evaporation pond and the removal of the "supplementary water balance ponds" due to their intended design and use as evaporation ponds.

### 8.2 Emission sources

Identification of key emissions is set out in Table 12 below. The decision document for the Works Approval identified some operational issues, but not all of them. The key emissions have now been identified more clearly for both the construction (Works Approval) and operation (Licence) periods. The identification of risks arising from the operations of the Premises is required to ensure that any infrastructure requirements for the control of risks are appropriately conditioned under the Works Approval.

**Table 12: Identification of key emissions**

	Period and Activity	Details	Frequency (from the Application)	Potential emissions	Key contributing factors
1	Construction Construction of hardstand areas and ponds	Civil earthworks to prepare hardstand areas and dam construction. Equipment will be brought onsite to level and compact materials for hardstanding.	0700 to 1900 hours Monday to Saturday	Dust emissions from placement and levelling of soils and dam construction. Odour generated during the placement of asphalt on hardstand area. Noise from construction vehicles and plant.	Nature and quantities of materials used.  Characteristics of equipment used during construction  Day and time of construction activity
2	Operation Operation of the compost	Acceptance, treatment and handling of feedstock and composting material,	0700 to 1900 hours Monday to Saturday	Leachate runoff from hardstand areas Odour and bio-aerosols	Maintenance of infrastructure

	Period and Activity	Details	Frequency (from the Application)	Potential emissions	Key contributing factors
	facility	including aeration of material.		<p>(including pathogens - viruses, bacteria, protozoa and helminths) from acceptance and handling of feedstock and compost turning activities.</p> <p>Noise generated by equipment associated with green waste shredding and aerating of windrows, and vehicles delivering feedstock and removing compost product.</p> <p>Dust lift-off from composting windrows and mulching operations.</p> <p>Pathogen and contaminant risks in product.</p>	<p>Nature (type and suitability) and quantities of feedstock materials</p> <p>Management of the composting process</p> <p>Equipment and vehicle maintenance</p> <p>Day and time for equipment used as part of the composting process (e.g. compost turner)</p> <p>Lack of definition of process control, "quality water" and the potential use of attenuated water from the composting pad post thermophilic process, may result in pathogen and biological contaminants reaching the home users.</p>

The source and types of emissions are identified in Table 13 below.

**Table 13: Potential emission sources**

		Potential Emission				
		Emission to Air			Noise	Leachate infiltration to land and groundwater
		Dust	Odour	Pathogens		
<b>Source</b> (see Section 3.1 for infrastructure references)	<b>Construction</b>					
	Equipment brought on site for pond construction, levelling and stabilising surfaces and sealing compost hardstand (bitumen)	•			•	
	Bituminous product for hardstand		•			
	<b>Operation</b>					
	Operation of mobile vehicles and plant (e.g. compost turner, front end loader and bob cat, excavator, water cart, green waste grinder and trucks)	•			•	
Feedstock, compost and product (containment infrastructure)	•	•	•		•	

### 8.3 Hazard – Pathway – Receptor Identification

The emission types with the pathway and receptors during the construction period under the Works Approval are identified in Table 14. Emission types, pathway and receptors during the operation period are identified in Table 15.

**Table 14: Emissions during Works Approval**

	Emission Type		
	Dust (from construction activities)	Noise (from machinery involved with infrastructure construction)	Odour (from materials used to seal hardstand)
<b>Potential Receptor</b> (see Section 7 for receptor details)	Adjoining piggery, nearest residential receptors are 3.7km and 7.0km west of the proposed composting facility (or 3km and 6.3km from the premises boundary)	Nearest residential receptors are 3.7km and 7.0km west of the proposal. Piggery also a noise generator	Nearest residential receptors are 3.7km and 7.0km west of the proposal, and workers at the adjoining piggery.
<b>Pathway Assessment</b> (see Section 7.7 for meteorological details)	Air (windborne)	Air (windborne)	Air (windborne)
<b>Potential impact</b>	Amenity values through reduced air quality from airborne particulates and deposition of materials on potential receptors	Amenity impacts	Amenity impacts
<b>Continued to detailed risk assessment</b>	No (Receptor located 3.7km away, very limited duration for construction activity)	No (Receptor located 3.7km away, very limited duration for construction activity)	No (Receptor located 3.7km away, very limited duration for construction activity)

**Table 15: Emissions during Operation**

	Emission Type				
	Dust (from materials handled)	Noise (from infrastructure and operations)	Odour (from contaminated stormwater and materials handled)	Leachate infiltration to land (from contaminated stormwater and materials handled)	Pathogens and contaminants
<b>Potential Receptor</b> (see Section 7 for receptor details)	Adjoining piggery, nearest residential receptors are 3.7km and 7.0km west of the proposed composting facility (or 3km and 6.3km from the premises boundary)	Nearest residential receptors are 3.7km and 7.0km west of the proposal. Piggery also a noise generator	Nearest residential receptors are 3.7km and 7.0km west of the proposal, and workers at the adjoining piggery	Groundwater – both regional and ephemeral surficial groundwater lens (the surficial aquifer potentially expresses at constructed seeps (potentially used as livestock watering) and damplands in the area	Adjoining piggery, nearest residential receptors are 3.7km and 7.0km west of the premises.  As the final compost product is intended for “home” use. through the small retail market.
<b>Pathway Assessment</b> (see Section 7.7 for meteorological details)	Air (windborne - Prevailing winds from the east)	Air (windborne - Prevailing winds from the east)	Air (windborne - Prevailing winds from the east)	Runoff of leachate from hardstand and/or overflowing pond through underlying soils (sand and gravels underlain by thick sandy clays). Failure of integrity of hardstand and /or pond	Air (inhaled or ingested) and over land (vector transmission e.g. flies, scavenging birds, rats and cats)  Persons unfamiliar with biological risks may inappropriately handle a product that has been cross contaminated with attenuated water
<b>Potential impact</b>	Amenity values through reduced air quality from airborne particulates and deposition of materials on potential receptors	Amenity impacts	Amenity and health impacts	Ecosystem health: local contamination of soils and potential contamination of groundwater	Amenity at sensitive receptors, nuisance of potential pathogen vectors such as flies, scavenging birds and vermin.  Health impacts of workers at the neighbouring piggery and end users of the

Emission Type					
	Dust (from materials handled)	Noise (from infrastructure and operations)	Odour (from contaminated stormwater and materials handled)	Leachate infiltration to land (from contaminated stormwater and materials handled)	Pathogens and contaminants
					compost. Biosecurity of the Piggery.  Potential exposure to hazard with permanent prolonged adverse health effects expected to small population
<b>Continued to detailed risk assessment</b> (see Section 8.6)	No (Receptor located 3.7km away)	No (Receptor located 3.7km away)	Yes	Yes	Yes

## 8.4 Risk Criteria

The Delegated Officer has applied the risk criteria in Table 16 below to determine the risk ratings set out in section 8.6 to 8.8.

**Table 16: Risk Criteria**

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the risk / opportunity occurring.		The following criteria has been used to determine the consequences of a risk occurring:		
			Public Health	Ecosystem/ Environmental
Almost Certain	The event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> <li>Loss of life</li> <li>Exposure to hazard with permanent prolonged adverse health effects expected to large population</li> <li>Health criteria is significantly exceeded</li> </ul>	<ul style="list-style-type: none"> <li>Irreversible impact to significant high value or sensitive ecosystem expected</li> <li>Irreversible and significant impact on a wide scale</li> <li>Total loss of a threatened species expected</li> <li>Ecosystem criteria is significantly exceeded</li> </ul>
Likely	The event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> <li>Exposure to hazard with permanent prolonged adverse health effects expected to small population</li> <li>Significant impact to amenity for extended periods expected to large population</li> <li>Health criteria is exceeded</li> </ul>	<ul style="list-style-type: none"> <li>Long-term impact to significant high value or sensitive ecosystem expected</li> <li>Long-term impact on a wide scale</li> <li>Adverse impact to a listed species expected</li> <li>Ecosystem criteria is exceeded</li> </ul>
Possible	The event could occur at some time	Moderate	<ul style="list-style-type: none"> <li>Exposure to hazard with short-term adverse health effects expected requiring treatment</li> <li>Impact to amenity expected for short periods to large population</li> <li>Health criteria is at risk of not being met</li> </ul>	<ul style="list-style-type: none"> <li>Minor and short-term impact to high value or sensitive ecosystem expected</li> <li>Off-site impacts at a local scale</li> <li>Ecosystem criteria is at risk of not being met</li> </ul>
Unlikely	The event is unlikely to occur	Minor	<ul style="list-style-type: none"> <li>Exposure to hazard with short-term adverse health effects expected</li> <li>Impact to amenity expected for short periods to small population</li> <li>Health criteria are likely to be met</li> </ul>	<ul style="list-style-type: none"> <li>Moderate to minor impact to ecosystem component (physical, chemical or biological)</li> <li>Minor off-site impacts at a local scale</li> <li>Ecosystem criteria are likely to be met</li> </ul>
Rare	The event may only occur in exceptional circumstances	Insignificant	<ul style="list-style-type: none"> <li>No detectable impacts to health</li> <li>No detectable impacts to amenity</li> <li>Health criteria met</li> </ul>	<ul style="list-style-type: none"> <li>None or insignificant impact to ecosystem component (physical, chemical or biological) expected with no effect on ecosystem function</li> <li>Ecosystem criteria met</li> </ul>

## 8.5 Risk Treatment

Risks will be treated in accordance with the Risk Treatment Matrix below:

**Table 17: Risk Treatment**

Risk Rating	Acceptability	Treatment
<b>Extreme</b>	Unacceptable.	Risks will not be tolerated. DER will refuse proposals.
<b>High</b>	Acceptable subject to primary and secondary controls.	Risks will be subject to multiple regulatory controls including primary and secondary controls. This will include both outcome-based and management conditions.
<b>Moderate</b>	Acceptable, generally subject to primary controls.	Risks will be subject to regulatory controls with a preference for outcome-based conditions where practical and appropriate.
<b>Low</b>	Acceptable, generally not requiring controls beyond the proponents controls.	Risks are acceptable and will generally not be subject to regulatory controls.

## 8.6 Risk of Odour Impact Analysis

### 8.6.1 General Hazard Characterisation and Impact

#### Operation

Odour may result from the storage of raw feedstocks, handling of feedstock and composting material and the composting process (compost turning and breakdown of organic material generates VOCs).

The types, volumes and characteristics of feedstock received and stored will influence odour generation. Allowing the development of anaerobic conditions at any stage of material storage and the composting process will generate additional odour. Furthermore, low carbon to nitrogen (C:N) ratios can lead to surplus nitrogen levels which will result in the release of odorous nitrogen compounds into the atmosphere in the form of ammonia gas.

The existing piggery is already a source of odour that could potentially increase cumulative emissions. The Works Approval Holder has also submitted a licence amendment application for the Piggery for the construction of a covered anaerobic pond, which will potentially reduce odours from the wastewater treatment. No odour complaints have been registered with DER for the existing piggery.

The Works Approval Holder recognised that appropriate C:N ratios would be in the order of 25-30:1 and be based on each ingredient. A review of New South Wales, Victorian and South Australian environmental agency guidelines and other web-based information sources variably indicate that the feedstock C:N ratio of between 20-40:1 is necessary for satisfactory composting, with ratios between 25:1 and 35:1 being more preferable. The anticipated C:N ratios of solid and liquid waste feedstocks will need to be adequately demonstrated in the licence application for the composting facility.

The nearest sensitive receptor is 3700 metres to the West with winds being predominantly easterly.

## 8.6.2 Consequence

Taking into consideration the direct application of large volumes of liquid waste, odours may result due to incorrect C:N ratio and may impact upon the amenity of the nearest rural dwelling. Therefore, the Delegated Officer considers the operational consequence rating to be **moderate**

## 8.6.3 Likelihood of Consequence

Taking into consideration the application of potentially odorous liquid waste, the uncertainty of management of the C:N ratio, the separation distance from residential receptors and their location downwind from the Premises, the Delegated Officer considers the likelihood rating to be **possible**.

## 8.6.4 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above for the Risk Criteria (Table 15) and determined that the overall rating for the risk of odour impacts on sensitive receptors during operations is **moderate**.

## 8.7 Risk of leachate and contaminants infiltrating to soils and groundwater Impact Analysis

### 8.7.1 General Hazard Characterisation and Impact

#### Operation

Leachate discharges can enter the environment through runoff of contaminated storm water, overflow and /or failure of storage and processing infrastructure, along with runoff from the non-composting hardstand, green waste surge pad. This leachate will infiltrate into the underlying soils to either the ephemeral perched aquifer where the leachate could be expressed in a diluted form in soaks within the surrounding area (potentially used for livestock watering), or eventually infiltrate the regional groundwater table; the Piggery relies on groundwater extraction for its operations.

### 8.7.2 Risk of insufficient storage capacity

The Application only considers a 1 in 10 year storm event. Ponds and tanks storing leachate must have the minimum capacity to store the total of the equivalent volume from a 1 in 20 year storm event (20 year ARI) of 24 hours duration that is collected from the operational area assuming 100% runoff coefficient.

The Delegated Officer considers that the design intent of the “Supplementary Water Balance Ponds” as described in section 3.3 indicates the ponds are intended to dispose of liquid waste via evaporation and not to store excess liquid wastes.

The Delegated Officer notes that additional information as to the proposed liquid waste management practices will be required at the licence application stage in order to assess the risk of over topping of the leachate dam.

### 8.7.3 Composting runoff

The Application proposes to mulch green waste in preparation for composting on a stabilised but unsealed non-composting hardstand. Finished product may also be stored on this hardstand. Any runoff generated from materials stockpiled in this area will runoff and enter the environment.

Given the existing climate, compacted hardstand of the mulched green waste, stabilisation of the compost product, and depth to groundwater, no further controls are proposed for the storage of this material.

#### 8.7.4 Consequence

Taking into consideration the presence of a shallow ephemeral groundwater lens (present during high intensity storm events) that will transmit and dilute any leachate in the soil to soaks in the area (minor off-site environmental impacts at a local scale) the risk of leachate contamination is minor. Taking into consideration the regional groundwater table is at a depth of greater than 60m the risks of contamination to groundwater is insignificant.

Therefore, the Delegated Officer considers the consequence rating to be **minor**.

#### 8.7.5 Likelihood of Consequence

Taking into consideration additional information provided by the Applicant on the 10 October 2016 delineating the nature of the liquid waste and the inferred significant reduction in pond storage, it is possible that the consequence could occur at some time.

Therefore the Delegated Officer considers the likelihood rating to be **possible**.

#### 8.7.6 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above for the Risk Criteria (Table 15) and determined that the overall rating for the risk of leachate and contaminants impacts on environmental receptors during operations is **moderate**.

### 8.8 Pathogen and contaminant Impact Analysis

#### 8.8.1 General Hazard Characterisation and Impact

The Application indicates that the Premises will produce compost, soils and mulches for home, commercial and agricultural use. Material that is intended to be, or is available to be, sold to small retail customers must meet the requirements of Australian Standard (AS) 4454: 2012 Composts, Soil Conditioners and Mulches (AS 4454: 2012). Any product material must also meet the Product Standards (AS4454) before blending occurs with additional matter (blending with wastes of any type are not permitted) for a specific end market involving small retail customers.

The Applicant has outlined that batch compliance monitoring is undertaken in accordance with AS 4454: 2012 (page 42 of the Application Document).

Airborne particulates and or water droplets that may contain bacteria, viruses, pathogens or other microorganisms, fungi and fungal spores may be moved during the movement or agitation of materials during the composting operation. This is most likely to occur when dust is produced during turning of windrows or in the final product.

There are pathogen and contaminant risks from use of controlled liquid wastes as specified by the Application, where wastes may be obtained from a variety of different sources.

Pathogens and contaminants may impact on the health of the compost end-user if the compost is not properly pasteurised. Furthermore, inadequate covering of certain feedstocks and pooling of leachate will also attract vectors, including vermin creating a nuisance.

The proposed use of "normal compost process management" relating to dust monitoring (Section 5.4.2, page 53 of Application, November 2014). Other operators within Western

Australia use water for dust and moisture control of mature compost stockpiles. The lack of process definition, quality water and the proposed use of attenuated water from the composting hardstand for dust control may result in recontamination of the composting material with pathogens and biological agents.

### 8.8.2 Consequence and Likelihood

End users in direct contact with the product may also experience prolonged adverse health effects where the compost is used in food production or through the inhalation/ingestion of microorganisms within the product. The residence 3.7km away is not expected to have detectable impacts given the separation distance.

### 8.8.3 Consequence of Likelihood

Taking into consideration the continuous use of controlled (liquid) waste liquids as the primary source of moisture in the composting process (especially advanced stages of the pasteurisation process and the use of attenuated water from the composting leachate pond post pasteurisation), potential recontamination of composting product will possibly occur.

The Delegated Officer considers the consequence rating for the operation is **major** and the likelihood rating is **possible**.

### 8.8.4 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above for the Risk Criteria (Table 15) and determined that the overall rating for pathogen and contaminants on sensitive receptors during operations and the final product is **high**.

## 8.9 Summary of Risk Assessment and Acceptability

The risk items identified in section 8 including the application of risk criteria and the acceptability with treatment are summarised in Table 18 below.

**Table 18: Risk rating of emissions for both Works Approval and Licence**

	Emission		Pathway and Receptor	Proponent controls	Impact	Risk Rating	Acceptability with treatment (conditions on instrument)
	Type	Source					
1	Odour	Feed stock and composting operations	Airborne to nearest rural residence 3.7km west of the Premises.	Infrastructure and management controls	Amenity of nearest residential receptors	Moderate consequence, Possible <b>Moderate risk</b>	Acceptable subject to proponent controls and regulatory controls
2	Leachate and contaminants infiltrating to soils and groundwater	Leachate generated from feed stock, composting operations and product	Direct from infrastructure to land and infiltration to groundwater.	Infrastructure and management controls.	Impacts on water quality and visibility	Minor consequence Possible <b>Moderate risk</b>	Acceptable subject to proponent controls and regulatory controls
3	Pathogen and contaminants	Controlled liquid waste, composting operations and final product	Airborne and transmission by vectors to workers on the property and end users of the product	Management Control	Impacts on product end users.	Major consequence, Possible <b>High risk</b>	Acceptable subject to regulatory controls

## 9. Determined Regulatory Controls

### 9.1 Controls required for construction and operational risks

Table 19: Appropriateness of controls

		Controls			
		9.2 Infrastructure and Equipment (Works Approval)	9.4 Feedstock acceptance controls (Licence condition)	9.4 Process controls (Licence condition)	9.4 Pathogen and contaminant monitoring (Licence condition)
Risk Items (see section 7)	1. Dust from construction and operation	Low risk.			
	2. Noise from infrastructure and operations	Low risk.			
	3. Odour from construction	Low risk.			
	3. Operations: Odour from feedstock and composting operations	●	●	●	
	4. Operations: Leachate and contaminants infiltrating to soils and groundwater	●	●	●	●
	5. Operations: Pathogens from composting operations		●	●	●

## 9.2 Works Approval Amendments

The Delegated Officer has made a number of findings in the review of the Works Approval, resulting in amendments to the conditions in the Works Approval as set out in the Amendment Notice. The amendments and reasons for the amendments are set out below.

### 9.2.1 Restriction of Liquid waste acceptance infrastructure

#### Grounds for amendment

- The activities and operation of the Premises as it relates to the use and application of controlled (liquid) waste is through the direct application of liquid waste to compost windrows as it arrives at the Premises. Subsequently, the requirement for the primary water balancing pond and three liquid waste ponds is not required as liquid waste treatment and storage is not occurring on site.
- On the assumption that the composting process is based on direct application of liquid waste to windrows, the storage of excess liquid waste and leachate should be sufficiently managed by the proposed leachate management infrastructure, including the leachate storage dam to be constructed under the Works Approval.
- The evaporative design of three liquid waste ponds means that excessive moisture lost is likely to occur ultimately causing uncertainty in the management of the C:N ratio in compost.
- There remains a high level of uncertainty as to the operational process for maintaining moisture content of compost in the final stages of the process without an adequate supply of quality water.
- Taking into account the level of uncertainty there remains a higher level of risk associated with use of controlled (liquid) waste in the composting process and final product.

In making this recommendation to amend the Works Approval, the Delegated Officer has considered relevant DER Guidance Statements as follows:

Guidance Statement: Setting Conditions (October 2015) sets out the: “Works approvals and licences may be granted subject to conditions that are:

- “(a) *valid, meaning that conditions will: be fairly and reasonably related to the activities within the category of prescribed premises the subject of the licence;*  
...
- (c) *risk-based, meaning that conditions will be proportionate to the level of risk (likelihood and impact) that the activity poses to public health and the environment.”*

## Decision

The Delegated Officer has amended the granted Works Approval as the acceptance of liquid waste in excess of that required for the direct application to the composting windrows is considered to be unnecessary based on the proposed operation of the Premises.

**Amendment 1:** The front page has been amended to remove the premises production or design capacity from 50,000 tonnes to “*To allow for the acceptance of controlled (liquid) waste only*”.

**Amendment 2:** Table 1.2.2: Work Specification, section 4. Removal of section 4 relating to the construction of three new water balance ponds.

### 9.2.2 Planning approval

#### Grounds for amendment

- The Planning Approval had lapsed at the time the Works Approval was granted.
- The proposal is not covered by a current Planning Approval.

In making this recommendation to amend the Works Approval, the Delegated Officer has considered relevant DER Guidance Statements as follows:

*Guidance Statement: Land Use Planning (October 2015) sets out that “DER will take the duration of planning approvals into account when determining the duration of works approvals, licences or permits granted under the EP Act, consistent with DER’s Guidance Statement: Licence Duration”*

## Decision

The Delegated Officer has amended the granted Works Approval as a Planning Approval does not currently exist for the proposal.

**Amendment 3:** New condition requiring Works Approval Holder to provide evidence of planning approval for the works at least 14 days prior to the commencement of the works

### 9.2.3 Premises Map

#### Grounds for amendment

The Premises map requires amending to more appropriately reflect the Premises boundary. This includes the exclusion of Primary water balancing pond located as primary infrastructure for the existing Piggery (L5724/1993/11).

**Amendment 4:** Premises map to be revised.

## 9.3 Licence Conditions

The main risks of operations have been identified in Section 8 of this Decision Report. In order to control for these risks, the Licence will contain conditions:

- volume and type of feedstock/liquid waste acceptance;

- confirmation of the source of appropriate quality water to maintain moisture levels during the final stages of and post pasteurisation process;
- process controls, including:
  - C:N ratio which must be maintained between 25 and 35:1; and
  - no leachate, liquid waste or attenuated water to come into contact during maturation phase (compost intended for small retail users); and
- pathogen and contaminant limits and monitoring requirements.

## 10. Appropriateness of Works Approval Conditions

The conditions in the Works Approval, as amended by the Amendment Notice, have been reviewed and the Delegated Officer has affirmed that they have been set in accordance with DER's *Guidance Statement on Setting Conditions*. The amendments set out in the Amendment Notice have also been determined by the Delegated Officer in accordance with DER's *Guidance Statement on Setting Conditions*.

DER notes that it may review the appropriateness and adequacy of controls at any time, and that following a review, DER may initiate amendments to the works approval under the EP Act.

## 11. Applicant's Comments

The Works Approval Holder was provided with the draft decision report and draft amended Works Approval on 5 July 2016. Comments in respect of the proposed amendment were received 1 August 2016 and additional information and comments were received on 10 October 2016. These comments are summarised in Appendix 3 along with consideration of these comments. The consideration of these comments has resulted in changes to the decision report and minor changes to the amended Works Approval.

## 12. 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 2).

The Delegated Officer has made a number of findings in the reassessment of the Application, resulting in the decision to amend the granted Works Approval (W5632/2014/1) in accordance with the Amendment Notice set out in Attachment 1.

**Agnes Tay**

**Director Strategy and Reform**

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

# Appendix 1: Shire of Gingin Minutes Ordinary Meeting of Council 17 December 2013

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ORDINARY MEETING  
SHIRE OF GINGIN

MINUTES

17/12/2013

## 11.1.10 APPLICATION FOR PLANNING APPROVAL - PROPOSED EXTENSION TO COMPOSTING FACILITY ON LOT 10 WANNAMAL ROAD WEST, BOONANARRING

**FILE:** BLD/2337  
**APPLICANT:** WESTPORK PTY LTD  
**LOCATION:** LOT 10 WANNAMAL ROAD WEST,  
BOONANARRING  
**OWNER:** WESTPORK PTY LTD  
**ZONING:** GENERAL RURAL  
**AUTHOR:** KEVIN TANG – MANAGER STATUTORY PLANNING  
**REPORTING OFFICER:** JEREMY EDWARDS – CHIEF EXECUTIVE OFFICER  
**REPORT DATE:** 17 DECEMBER 2013  
**REFER:** NIL

### OFFICER INTEREST DECLARATION

Nil

### PURPOSE

To consider an Application for Planning Approval for an extension to the existing composting facility on Lot 10 Wannamal Road West, Boonanarring

### BACKGROUND

This Application requires Council's urgent attention as the Applicants are keen on completing all necessary site and construction works before the coming winter.

The subject lot consists of approximately 310 hectares of General Rural zoned land currently used partly for a piggery and a pine tree plantation. The predominant surrounding land use is state forest and virgin bush with the closest sensitive land use being more than 3.7km away. The site is adjacent to a gravel pit currently owned and used by the Shire.

Westpork Pty Ltd (Westpork) has been operating this piggery for decades and has provided local employment opportunities and economic growth in the region. The current design capacity of this piggery is 65,000 in accordance with the Department of Environment Regulation (DER) licence.

In association with the piggery operation, Westpork first obtained a Planning Approval and Offensive Trade Licence (under the *Health Act 1911*) for a Composting Facility in 1997. The Offensive Trade Licence has been renewed annually and remains current. It should also be noted that Westpork also holds a valid DER licence for Intensive Piggery under the *Environmental Protection Act 1986*.

The proposed extension to the existing composting facility is a partnership between Westpork and Bio-Organics, which produces a variety of compost products and fertilisers and operates a licenced composting facility in Oakford. It is the intention of Bio-Organics to utilise the proposed development for their composting operations.

In return, Bio-Organics, with its expertise in the operation of a composting facility, will manage dead pigs and pig manure for Westpork. In order for this development to proceed, the facility will be required to obtain Categories 67A and 61 licences from DER as a compost manufacturing and soil blending and liquid waste facility

The proposed development will include the following items:

- 6 hectare composting pad. Constructed with 300mm thick locally sourced gravel compacted and stabilised and treated in accordance with the requirements of DER as specified by a certified civil engineer to meet the strength and permeability requirements. The pad shall be graded to control stormwater to a collection dam where water is stored for re-use in the composting process and for dust control;
- Evaporation ponds. Storage of approved liquids in evaporation ponds shall occur via concrete pits and pipes located adjacent to the compost pad. A 50,000 cubic metre evaporation pond is already constructed and it is proposed to build three smaller ponds to accommodate separate wastewater streams;
- Grease separator. For grease trap not immediately recycled in the compost, a treatment plant shall be used to separate lipids and solids prior to discharge into the evaporation ponds;
- Site facilities, including a site office, bathroom, machinery workshop and related buildings

The proposed Composting Facility is planned to take the following waste:

- Shredded greenwaste (primary source of carbon). This being the predominant ingredient. Expected volume circa. 30,000 - 50,000 t.p.a.
- Nitrogenous solid wastes. Those wastes that are compostable such as food-stuffs, vegetable matter, manure, maltings sludge, other food wastes, spoiled fertilisers, etc. Expected volume of circa. 10,000 – 20,000 t.p.a.
- Benign solid wastes. Non-biodegradable wastes, which after being broken down, are beneficial for the soil. Including bentonite clays, plasterboard and other minerals. Expected volume of circa. 5,000 – 10,000 t.p.a.
- Nitrogenous liquid wastes. Bulk liquids, predominantly water, that contain biodegradable contaminants that are non-toxic, digestible by compost microorganisms and do not contain elevated concentrations of heavy metals, hydrocarbons, salts or pesticides. These include grease trap, pond water and stormwater and some washdown from industry processes. Other wastewater suitable for composting shall be either directly applied to a composting row or diverted to ponds for recycling during summer. These include treated greasetrap, saline water and some washdown from industry processes. Expected volume circa. 30,000 – 50,000 ton p.a.
- Other liquid wastes beneficial for plant health after composting, including phosphoric acid and ink-press wash. Small volumes only.

- Blending ingredients which are not composted. Including peat, sand and sawdust which are sourced from local quarries and suppliers for the purpose of creating soil mixes when blended with compost.

The proposed composting facility is a non-conforming use under Local Planning Scheme No. 9, to which Council, at its discretion, may grant an approval.

A location plan and applicant's proposal are provided as **Appendix 1**.

## **COMMENT**

### **Environmental Impacts**

The Environmental Protection Authority Guidance Statement No. 3 (EPA Guidance Statement No. 3) for Separation Distances between Industrial Land and Sensitive Land Uses stipulates a 1000m buffer between an open air composting facility and sensitive land use. The proposed development will comply with this requirement.

It is also expected that all environmental issues will be dealt with through the DER licensing regime. The Applicant is in the process of obtaining relevant DER licences.

Council may wish to only consider the amenity impacts and proper and orderly planning for this locality.

### **Servicing**

The applicant advises that potential traffic increase will be ten vehicle movements per day as the existing compost facility will be replaced by the proposed one.

### **Community Consultation**

The proposal has been referred to adjoining land owners within a 1km radius of the subject site and State Agencies for comment in accordance with Local Planning Scheme No. 9 (LPS No. 9). The public advertising closes on 16 December 2013.

The Schedule of Submissions and Recommended Responses will be provided at the Council Meeting.

### **Advice Notes**

Should Council approve this development, the following advice notes may be added:

- A. Further to this approval, the Applicant is required to submit working drawings and specifications to comply with the requirements of the *Building Act 2011* and the *Health Act 1911* which are to be approved by the Shire of Gingin's Manager Building Services and/or Executive Manager Regulatory Services prior to issuing a Building Permit.

- B. This approval is for an Extension to Composting Facility only. In the General Rural zone, further approval is required for most land uses and building construction. The Shire of Gingin's Planning Department should be contacted for further information.
- C. Prior to the installation of a water bore, a licence is to be obtained from the Department of Water.
- D. The *Environmental Protection Act 1986* contains penalties where the noise limits prescribed by the Act are exceeded and it is suggested that the Applicant have due regard for this in the operation of the development.
- E. Please be advised that the proposed development will require Categories 67A and 61 Licences through the Department of Environment Regulations industry licensing regime.

### STATUTORY ENVIRONMENT

#### Local Planning Scheme No. 9 – Section 4.9

Clause 5.8 of State Planning Policy 2.5 – Land Use Planning in Rural Areas uses EPA Guidance Statement No. 3 for determination of minimising conflicts between different land uses.

### POLICY IMPLICATIONS

Nil

### BUDGET IMPLICATIONS

Nil

### STRATEGIC IMPLICATIONS

Shire of Gingin Strategic Community Plan 2013-2023

<b>Focus Area</b>	<i>Leadership and Governance</i>
<b>Objective</b>	<i>2. Accountable and responsible governance</i>
<b>Outcome</b>	<i>2.1 Deliver accountable and good governance</i>
<b>Strategy</b>	<i>2.1.2 Develop policy and strategy which supports sound decision making</i>
<b>Focus Area</b>	<i>Local Business</i>
<b>Objective</b>	<i>1. A unique tourism destination</i>
<b>Outcome</b>	<i>1.1 High quality tourism opportunities</i>
<b>Strategy</b>	<i>1.1.1 Attract and develop a diverse range of tourism providers</i>
	<i>1.1.2 Encourage a high standard of tourism products and services</i>

**ADDENDUM – ORDINARY MEETING OF COUNCIL – 17 DECEMBER 2013**

**Additional Information:**

Following is the Schedule of Submissions and Recommended Responses:

<b>No.</b>	<b>Submitter</b>	<b>Submission Detail</b>	<b>Recommended Response</b>
1.	Ratepayers	<p>Submitters do not support the proposal and make the following comment:</p> <ol style="list-style-type: none"> <li>1. The Applicant for Lot 10 has not submitted any supporting reports or documentation regarding possible environmental or odour impacts of this proposal on our ..... land.</li> <li>2. The existing piggery facility has already impacted our land with odours and we are concerned that increased development will only add to this.</li> <li>3. The proposal has the potential to adversely impact the use and value of our land. We object to this proposal</li> </ol>	<ol style="list-style-type: none"> <li>1. Noted. In addition to this Planning Application, the Applicant is also required to obtain Category 67A licence for Compost Manufacturing and Soil Blending and Category 61 licence for Liquid Waste Facility from the Department of Environment Regulation under the Environment Protection Act 1986. It is expected that all environmental issues will be addressed through the DER licensing regime.</li> <li>2. Noted. The existing piggery has been operating for decades. No complaint has been received at the Shire within the recent three years from the surrounding landowners. Please also see the response above.</li> <li>3. Noted. The proposed development satisfies 1000m buffer requirement to the nearest sensitive land use and one of the objectives of the General Rural zone is to encourage more intensive agricultural activities. Having regards to Response 1.1, Council at its discretion may approve this development as an extension to the existing non-conforming use.</li> </ol>

2.	Department of Parks and Wildlife	<p>Submitter makes the following comment:</p> <ol style="list-style-type: none"> <li>1. The development proposal has the potential to impact on Carnaby's Cockatoo habitat with proposed clearing of portion of adjacent pine plantation. Therefore the proponent may want to contact the Federal Department of the environment to discuss what referral obligations they may have under the Environment Protection and Biodiversity Act 1999.</li> <li>2. It is recommended that the Shire refer the proposal to the Department of Environment Regulation.</li> </ol>	<ol style="list-style-type: none"> <li>1. Noted. Under the Environment Protection and Biodiversity Act 1999, the proponent is responsible for referring the proposal to the Federal Department of Environment. Officers have recommended that an Advice Note be added to this effect.</li> <li>2. Noted. The Application was referred to the Department of Environment Regulation on 2 December 2013.</li> </ol>
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**Voting Requirements:**

Simple Majority

**Recommendation:**

*This additional information does not change the Officer's Recommendation.*

**VOTING REQUIREMENTS – SIMPLE MAJORITY**

**RECOMMENDATION**

It is recommended that Council:

1. Grant Planning Approval for the extension of Composting Facility on Lot 10 Wannamal Road West, Beermullah, subject to the following conditions:

- a. The land use and development shall be undertaken in accordance with the approved plans unless otherwise conditioned in this Approval;
  - b. The hours of operation shall be from 7am to 5pm Mondays to Saturdays;
  - c. The development shall comply with the definition of Composting Facility as follows:

*premises on which organic material (excluding silage) or waste is stored pending processing, mixing, drying or composting to produce commercial quantities of compost or blended soils.*
  - d. This Approval is for an extension to the existing Composting Facility only. Hence, all liquid waste taken must be related to and used in the composting activities on the site; and
  - e. The number of Restricted Access Vehicle (in accordance with Main Roads WA standards) movements for this development is to be no more than ten per day, with a movement consisting of one trip to and one trip from the site. In the event there are any discrepancies between the proposed and actual vehicle movements, a contribution from the Applicant shall be required for the upgrade of Wannamal Road West to the satisfaction of the Chief Executive Officer.
2. Advise the Submitter(s) of the outcome.

## RESOLUTION

Moved Councillor Kestel that Council:

1. Grant Planning Approval for the extension of Composting Facility on Lot 10 Wannamal Road West, Beermullah, subject to the following conditions:
  - a. The land use and development shall be undertaken in accordance with the approved plans unless otherwise conditioned in this Approval;
  - b. The development shall comply with the definition of Composting Facility as follows:

*premises on which organic material (excluding silage) or waste is stored pending processing, mixing, drying or composting to produce commercial quantities of compost or blended soils.*
  - c. This Approval is for an extension to the existing Composting Facility only. Hence, all liquid waste taken must be related to and used in the composting activities on the site; and
  - d. Negotiations be undertaken with the Applicant with respect to a contribution for the up-grading of the unsealed portion of Wannamal Road West to the eastern boundary entrance to the Westpork facility prior to the commencement of the development, to the satisfaction of the Chief Executive Officer.
2. Advise the Submitter(s) of the outcome.

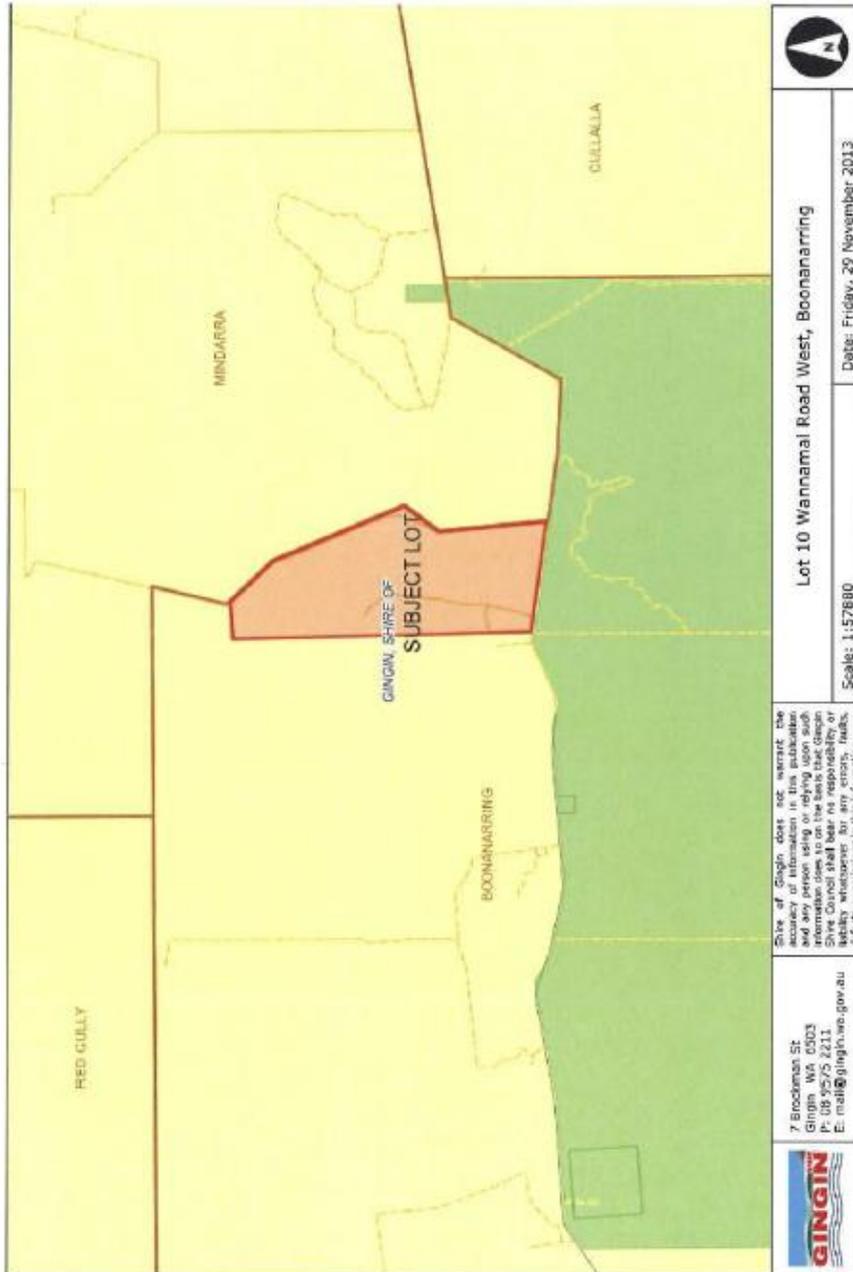
CARRIED UNANIMOUSLY

## REASON FOR VARIATION TO RECOMMENDATION

COUNCILLORS WERE OF THE VIEW THAT THE HOURS OF OPERATION SHOULD NOT BE STIPULATED AS THIS WOULD HINDER THE OPERATION OF THE BUSINESS AND THAT A CONTRIBUTION SHOULD BE MADE TO THE UP-GRADING OF WANNAMAL ROAD WEST BY THE DEVELOPER PRIOR TO COMMENCING THE DEVELOPMENT.

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# APPENDIX 1



 <p>7 Brockman St Gingin WA 6303 P: 08 9525 2211 E: mail@gingin.wa.gov.au</p>	<p>Shire of Gingin does not warrant the accuracy of information in this publication and is not responsible for any errors or omissions. Shire Council shall bear no responsibility or liability whatsoever for any errors, omissions, defects or omissions in this information.</p>	<p>Lot 10 Wannamal Road West, Boonamaring</p> <p>Date: Friday, 29 November 2013</p> <p>Scale: 1:57680</p>
	<p>Shire of Gingin does not warrant the accuracy of information in this publication and is not responsible for any errors or omissions. Shire Council shall bear no responsibility or liability whatsoever for any errors, omissions, defects or omissions in this information.</p>	

**Planning, Construction, Operation  
and Management Plan  
for the proposed  
COMPOST FACILITY  
At Wannamal Road West, Gingin.**

for

**BIO ORGANICS PTY LTD**

**29<sup>th</sup> NOVEMBER 2013**

Prepared by:  
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#### EXECUTIVE SUMMARY

This document has been prepared to provide details of the development and operation activities at the proposed Bio-Organics compost facility adjacent to Westpork's piggery at Lot 10 Wannamal Road West, Gingin, WA ("the site").

Bio-Organics have entered into an exclusive contractual relationship with Westpork as their tenant to operate the proposed compost facility (and associated waste management services) to be constructed and licensed by Westpork. Thereby this construction and management plan shall provide supporting documentation for any Development Application, Works Approval, Operating Licence or other authority requirement of Westpork.

Although the proposed compost facility is located adjacent to an existing piggery, this document is not intended to provide scope or significant consideration of the existing activities by Westpork. Fundamentally, this document relates to separate activities which, although contained wholly within Westpork's land, are located separate from the existing piggery activities. The interrelationship between the activities of Westpork and Bio-Organics shall be detailed herewith, but are essentially limited to: some shared access roads; shared power and water supply; movement of pig manure, sludge and dead pigs from the piggery to the compost facility; and transfer of a disused evaporation pond for use in the compost facility's liquid waste treatment process.

The Site consists of approximately 310 hectares of zoned rural land currently used partly for an offensive trade industry (intensive pig farm) and a pine tree plantation. The predominant surrounding land use is state forest and virgin bush with no dwelling or public or private activity. 1km west of the site is a gravel pit operated by the Shire of Gingin. The Shire of Gingin has advised that it is their intention to construct a waste transfer station on their adjacent site. 3.7km and 7km west are rural-residential dwellings and an oil/gas mining operation is located approximately 8.7km west near Brand Hwy. There is no potential impact from incompatible land use.

The proposed compost facility shall be located within an existing pine plantation, immediately east of Westpork's pig sheds (refer to site plan found at Appendix A). It shall be accessed via Wannamal Road West and use existing crossovers and internal access tracks for vehicle movement.

The compost facility shall encourage local employment of up to 12 persons and provide an essential service for both the Shire of Gingin and the greater Perth community: that being recycling certain household, agricultural and commercial wastes (diverting them from landfill and recycling wastewater) and, in turn, manufacturing quality composts, soils and mulches for use in the domestic and commercial landscape.

Bio-Organics has operated a large (50,000 tonnes per annum) licenced, compost facility in Oakford since 2001. It is an award-winning, quality operator with an excellent record and a strong foundation in WA's waste industry and landscaping market.

Bio-Organic's main office will remain in Oakford, however a manned site office at Gingin will ensure quality control measures are implemented both for material ingress and on-site management.

Various non-fixed plant and equipment are used for materials handling, turning compost, mixing soil and applying moisture. Ingredients and finished products are imported and exported in bulk volume trucks. General public trade will not be conducted. Site activity shall generally occur Monday to Saturday from 7:00am to 5:00pm and after hours by appointment.

Bio-Organics implements strict quality processes which shall be applied at the Gingin facility. They include OH&S policies, drug and alcohol policies, site security, vermin control, quality control and testing, material inspection and classification protocols, documentation and correction of non-conformances, and complaints handling procedures.

Key environmental and health issues of dust, noise and odour are addressed by complying with the relevant authority legislation and by the management procedures detailed in this document.

The outcome of this document is to sufficiently detail the proposed development and on-going activities in a manner to satisfy the regulatory authorities that there will be no adverse impact on adjacent landowners or the environment and is an appropriate use of the property according to its zoning. Moreover, that the benefits of the Bio-Organics compost facility and its essential services of waste reduction and recycling are a necessary activity for the Shire of Gingin, as well as for the state of WA.

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## 1 INTRODUCTION

### 1.1 BACKGROUND

The landowner (Westpork) has sought to partner with Bio-Organics and establish an exclusive contractual relationship for a long-term beneficial composting and recycling facility to be operated by Bio-Organics adjacent to their existing piggery in Gingin.

Westpork has strived to make a composting operation viable but simply composting pig manure and carcasses is an environmentally sustainable approach but one that is not commercially viable. In order to achieve a balance between environmental sustainability and commercial reality Westpork is allowing Bio-Organics to operate a full-scale, commercial compost facility on its property. In doing so Westpork achieves its goal of processing its manures and carcasses in a responsible manner but at the same time creating a viable composting operation which provides a disposal and recycling service for approved commercial wastes.

The site is located on Wannamal Road West, Gingin, approximately 10km east of Brand Hwy at Westpork's existing piggery.

In order to undertake composting and related activities on this rural parcel of land, Westpork shall acquire all necessary development approvals and operating licences from the respective regulatory authorities. Bio-Organics shall operate as a tenant of Westpork and comply with the licence conditions required of them.

### 1.2 PURPOSE OF THIS DOCUMENT

The purpose of this document is to provide technical, operational and management details of the proposed facility to accompany and satisfy (in part) any development applications or operating licenses sought by Westpork.

Within this document, reference to the "compost facility" shall be considered to include all infrastructure and activities pertaining to composting, the compost hardstand and its access roads, associated elements such as stormwater control devices, site offices, wastewater treatment and storage, evaporation ponds, solidification processes and any other such activities related to composting and liquid/solid waste treatment.

### 1.3 SITE DESCRIPTION

The site consists of approximately 310 hectares of zoned rural land currently used partly for an intensive pig farm and a tree farm (low value).

Access to the site is via a crossover located on Wannamal Road West.

The existing piggery activity is located central (new sheds) and north (old sheds) on the site. Westpork's site office is located south of the new sheds. Disused and new evaporation ponds and manure driers are located central on the site, northeast of the new sheds. Caretaker/employee dwellings are located in the southeast corner. The site has a gravel pit on its central-west side, from which gravel and clay for construction shall be sourced. Internal roads and tracks are located throughout the site.

Westpork operates 4 separate piggeries on the site. There are two piggeries located near the proposed composting facility - new sheds immediately west and an older, straw-based facility 700m north of the site. Mindarra Four's site office is located south of the new sheds. Immediately north of the

proposed site is Mindarra Four's pond system, which comprises of Anaerobic Ponds, Facultative Ponds, Evaporative Ponds and a spare pond. Caretaker/employee dwellings are located in the southeast corner. Internal roads and tracks are located throughout the site.

The site is predominantly cleared with some areas of residual native vegetation and a block of approximately 45 hectares of pine tree plantation immediately east of the new sheds and immediately south of the evaporation ponds. [NB It is within this pine plantation that the proposed compost facility shall operate].

Site plans are found at Appendix A.

The site consists of varied soil types. Generally, the lower areas to the east have a Karrakatta Formation yellow sand type, while the elevated soil to the west is lateritic clay and gravel. The natural water table sits below 60-80 metres of clay as indicated by the site's production bores which are 100-140m deep. The site is not considered at risk of flooding.

The topography is predominantly flat with an average RL varying from 195.0 to 210.0 AHD. An elevated hill is located on the mid-west side up to 239.0 AHD (location of gravel).

There are no watercourses or environmentally sensitive areas on or adjacent to the site.

The predominant surrounding land use is state forest or uncleared native virgin bush (north, east and south) and the Shire of Gingin's gravel pit operates on rural land to the west. There are no dwellings or public or private activities within the immediate area.

On Wannamal Road West at a distance of 3.7km and 7.0km west of the site are two rural-residential dwellings. An oil/gas mining operation is located approximately 8.7km west on Wannamal West Road near Brand Hwy.

The nearest urban land uses are located 20km south at the town of Gingin. Therefore there is no potential impact from incompatible land use because of the very large separation distances and the proposed compost activities are located immediately adjacent to the existing approved piggery (falling within any impact buffers).

#### 1.4 PLANNING FRAMEWORK

The site is located within the Shire of Gingin's *Local Planning Scheme No. 9 District Zoning Scheme* ("TPS9"). The proposed compost facility development is on land zoned "General Rural".

As excerpted from TPS9:

The objectives of the General Rural Zone are to:

- (a) manage land use changes so that the specific local rural character of the zone is maintained or enhanced;
- (b) encourage and protect broad acre agricultural activities such as grazing and more intensive agricultural activities such as horticulture as primary uses, with other rural pursuits and rural industries as secondary uses in circumstances where they demonstrate compatibility with the primary use;
- (c) maintain and enhance the environmental qualities of the landscape, vegetation, soils and water bodies, to protect sensitive areas especially the natural valley and watercourse systems from damage; and

- (d) provide for the operation and development of existing, future and potential rural land uses by limiting the introduction of sensitive land uses in the General Rural zone

Planning approval was granted in 1997 for a 'composting unit' on the site. This approval formed part of a larger proposal to expand the piggery activities, and it was through this approval that the existing composting infrastructure was constructed.

That planning approval was granted under the Shire's previous town planning scheme, and therefore the actual 'use class classification' is somewhat academic. As the use was 'substantially commenced' when the piggery was expanded, this application is effectively an expansion of an existing, lawful use on the site.

To the extent that land use definitions are relevant, TPS9 provides:

"industry" means premises used for the manufacture, dismantling, processing, assembly, treating, testing, servicing, maintenance or repairing of goods, products, articles, materials or substances and includes premises on the same land used for — (a) the storage of goods; (b) the work of administration or accounting; (c) the selling of goods by wholesale or retail; or (d) the provision of amenities for employees, incidental to any of those industrial operations

"industry - noxious" means an industry in which the processed involved constitute an offensive trade within the meaning of the Health Act 1911 (as amended), but does not include a fish shop, dry cleaning premises, laundromat, piggery or poultry farm;

The term 'industry-noxious' is somewhat of a misnomer, because it does not cover industries which would, in the public's view, be considered 'noxious' – for example, handling and treating of dangerous chemicals and wastes. Under the *Health Act*, any process which includes the use of manure is considered to be a 'manure works', which is an offensive trade as defined by that Act. Therefore, in theory, a composting facility which uses manure in its processes is considered to be a 'manure works', and there an 'industry-noxious' under TPS9.

'Industry-noxious' is an A use under TPS9 in the General Rural zone.

In any event, given the fact that the application is an extension of an existing use, the actual use class characterisation is not necessary – it is already approved as a 'composting unit'.

In addition to the need for planning approvals and environmental licensing Westpork operates on the site under an Offensive Trade Licence pursuant to the Health Act 1911 for both the operation of its piggeries as well as for the composting of its waste.

#### 1.5 LICENCES AND APPROVALS

The landowner (Westpork) shall apply to the Department of Environmental Regulation (DER) for necessary operating licenses and obtain DER consent that the existing works approval permits Bio-Organics to construct and operate the compost facility as described in this document (and in accordance with the contract between the parties).

The proposed compost facility will be licensed under the following DER *Environmental Protection Regulations 1987 Classification(s) of premises*:

- 61 Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated

- [Optional] 61A Solid waste facility: premises (other than premises within category 67A) on which solid waste produced on other premises is stored, reprocessed, treated, or discharged onto land.
- 67A Compost manufacturing and soil blending: premises on which organic material (excluding silage) or waste is stored pending processing, mixing, drying or composting to produce commercial quantities of compost or blended soils.

## 2 THE PROPOSED DEVELOPMENT

### 2.1 INTRODUCTION

This section of the document describes the proposed composting operation, its location, impact, infrastructure, timing and nature of work.

The information in this section should be read in conjunction with the Site Plan found at Appendix A.

### 2.2 DESCRIPTION OF DEVELOPMENT

The proposed development is for the purpose of conducting composting and related activities at the site. A general description of the range of activities is as follows:

- Composting greenwaste with various nitrogenous liquid and solid wastes (including pig manure, wastewater, etc) to produce high-quality compost and soils for home, commercial and agricultural use.
- Processing and pasteurizing greenwaste to manufacture high-quality mulches for home, commercial and agricultural use.
- Liquid waste treatment (separation, solidification, evaporation and composting).
- Soil blending, treatment and remediation.

Composting is the process of combining carbon and nitrogen sources at optimal moisture and oxygen conditions to permit thermophilic microorganisms to break down those sources into compost beneficial for plant health. Those sources are obtained through various controlled and non-controlled wastes, mixed and formed into windrows which are regularly wet and aerated for a period of up to 6 months. Compost product is matured and screened to meet compliance and customer preference.

Hand-in-hand with manufacturing compost are other related activities to be conducted at The Site. They include soil blending and manufacturing mulch.

Soil blending is the mechanical process of mixing various ingredients to form a homogenous soil. Soil mixes are predominantly made up of screened compost with varying ratios of sand, peat and sawdust. Different soil blends are manufactured to specific purpose. Soil blending is also a process by which contaminated soils can be remediated - an example being the use of limestone to neutralize acid sulphate soil, which can then form part of a beneficial soil/compost blend.

Manufactured mulch is shredded green waste, pasteurized to Australian Standards to become a safe product suitable for top-dressing landscapes. Mulch shredded to a consistent particle size is formed into a stockpile and water is added to permit thermophilic microorganisms to act for a period of several days (defined in Australian Standards). This is sufficient time to kill weed seeds, fungi, pathogens and other plant diseases.

Specialised treatment of wastewater is also proposed to operate with the compost activities. Although wastewater will generally be directly deposited into the composting windrow, surge volumes during winter shall be managed separately. This specifically refers to the use of various pre-treatment processes (such as screening and dissolved air flotation (DAF) to clean wastewater prior to being stored in a spare evaporation pond. This pond has already been constructed (approximately 50 million litres) but is not connected to the piggery's effluent system. Other, smaller specific ponds shall be constructed as part of the composting development to provide a partial cleaning process for specific wastewater. The purpose of storing wastewater is that it allows intakes to occur during the cooler months of the year that can then be utilized

by the composting facility during the summer months. All water brought onto the site is for composting, it is accepted by both parties that some will be stored on a temporary basis for reuse during dry periods.

Westpork has an existing water license that allows the uptake of groundwater for the purpose of operating a piggery enterprise. Westpork's existing allocation is fully utilized within the piggery operation; therefore simply pumping fresh water to the composting operation is not a viable proposition. To overcome this issue Westpork has allowed Bio-Organics to bring wastewater onto the site for composting purposes. Matching the available supplies of wastewater with the demand of an ongoing composting operation of this size means that some liquids will need to be stored on a short term basis. Hence peak intakes will occur during winter, with that water progressively being drawn down and used during the summer months.

Crucial to the long term success of reusing the evaporative/storage pond is the quality of the wastewater entering this pond. To overcome this issue within Bio-Organics development plan there are a series of smaller cleansing ponds/DAF units to be built to not only remove impurities from wastewater brought onto the site but to also clean the runoff water from the composting pad prior to it entering the storage pond. The removed material is to be taken immediately to the composting facility with only relatively clean water being discharged to the pond for later reuse.

Composting is to be carried out on top of a clay/gravel hardstand with low permeability constructed to the standard required by the DER to meet their permeability guidelines. Water run off shall be directed to a lined catchment dam and reused in the compost facility for moisture and dust control. Similarly, evaporation ponds shall be lined with PE and/or clay. The combined infrastructure forms a physical barrier between the compost activity and the natural environment (soil and groundwater). Furthermore, air quality is not adversely affected as water/wastewater used at the facility is consumed in the process.

Inputs/ingredients are received in bulk form from commercial processes. Predominantly, this is greenwaste. All other solid and liquid ingredients to be composted are proposed to be handled in a just-in-time manner – to avoid storing of ingredients where possible. That being, other than stockpiles of greenwaste, compost ingredients (solid and liquid wastes) are added to new and active compost rows as they arrive at the facility. Once mixed with sufficient greenwaste/compost (generally 4:1), risk to the environment from dust, odour, vermin/flies, etc. is mitigated. Fly breeding is not possible in active composting system because the heat generated and the turning process kills all insects.

Some waste streams to be handled under the Section 70A licence category may not be immediately composted. Wastewater received and determined to be suitable for safe and efficient storage (not likely to cause odour or be difficult to pump) can be deposited into purpose built storage/evaporation ponds. Some wastewater will be pre-processed. For example, screening of silt, or pre-separation of lipids with a DAF separator used to clean grease traps prior to transfer into evaporation ponds. This is part of the control process of the compost plant to ensure good housekeeping and superior finished product. This water will then be used during the drier months when extra liquids are needed within the composting process.

### 2.3 BUILDINGS AND CONSTRUCTION

The proposed construction at the site necessary to undertake the composting activities is as follows (refer to Site plan found at Appendix A):

- 6 hectare composting pad. Constructed with 300mm thick locally sourced gravel compacted and stabilised and treated in accordance with the requirements of the DER as specified by a certified civil engineer to meet the strength and permeability requirements. Pad shall be graded to control stormwater to a collection dam where water is stored for reuse in the composting process and for dust control.

delivery (such as an early morning fruit and veg load from a local growers market). The proposed operating times fall within the current activities of the piggery, which operates 7 days per week.

The remote location and lack of sensitive premises in the surrounding locality will ensure that out-of-hours activities will not cause an amenity impact.

#### 2.7 VEHICLE MOVEMENT

Vehicle movement predominantly refers to the carting of inputs (ingredients) to and outputs (products) from the composting facility. These vehicles are trucks and other similar heavy-haulage vehicles which have carrying capacities approximately ranging from 3 cubic meters to 100 cubic meters.

Trucks shall be fitted with dust suppression covers and appropriately licensed.

Vehicle access to the composting facility shall be via Wannamal Road West and the existing Westpork crossover. Wannamal Road West is currently used for commercial purposes – including a nearby gravel pit (operated by the Shire of Gingin), an oil/gas mining facility and for Westpork's current activities. It is predominantly sealed with the last 1km being unsealed and constructed suitable for heavy haulage traffic associated with the proposed compost facility. Traffic numbers on Wannamal Road West would be increased by an estimate average of 10 trucks per day.

Wannamal Road West connects to Brand Hwy which is a MRWA designated heavy haulage access road and appropriately reticulates all traffic throughout WA.

Personnel vehicles are limited to staff numbers of less than 12 and are of negligible impact.

The compost facility shall not be open or advertised to the public; therefore public vehicles movements are of no consequence.

This development will replace the current blending/composting operation. It is accepted that this development is bigger than the existing operation but with the closure of the existing operation and the move away from straw based sheds, total vehicle movements will not be increased 10 trucks/day associated with this development. What we will see is a decrease of approx. 5-6 trucks per day from the current operation, replaced by 10 truck movements associated with the new development. A total increase of 4-5 truck movements is anticipated.

#### 2.8 GENERAL PUBLIC

The facility is not open to the public for general trade. The Site perimeter and compost facility is fenced and located in a semi-remote region where public access is not expected.

#### 2.9 THE BENEFITS OF A COMPOST FACILITY

Composting and recycling are sustainable and highly beneficial activities when properly managed. Just a few of the many benefits of a composting facility include:

- The recycling of various wastes for beneficial re-use;
- Diverting waste from landfill;

- Producing soils which aid landscapes in home and commercial applications, including improving water-holding capacity and nutrition availability to plants;
- Removing unpasteurized mulch from the market (which causes significant spread of plant diseases and pathogens such as 'jarrah dieback');
- Remediating soils contaminated with pathogens and acid sulphate for beneficial re-use;
- Fixating carbon into the soil;
- Providing a process to meet Department of Health's policy for the use of poultry manure;
- Local employment;
- Provide a sustainable service to recycle greenwaste from the Shire of Gingin's refuse centres at Gingin, Lancelin and Seabird which has traditionally been burnt.

In addition, these benefits will directly add value to the shire of Gingin:

- The compost plant will be a receiver of vegetable waste. Directly inputting vegetable waste into windrows will immediately control and prevent the breeding of stable (and any other) flies. Bio-Organics process offers a cheap, close and sustainable method of disposing of these refractory wastes that cannot currently be disposed of efficiently because of distance and cost. This benefit can be realized immediately upon opening the facility
- Bio-Organics stands to be significant employer of male and female permanent full time staff which will be sourced from the local community
- Bio-Organics will provide a series of product streams for the council to make available to its parks and gardens and its ratepayers at substantial discounts as a goodwill gesture to the shire in which we operate. This will result in improved water efficiency of gardens, less fertilizer use and leaching and healthier plants and vegetables. Bio-Organics plans to assist Gingin to be even more waterwise.
- It is widely observed that the shire is subject to stable fly issues. Offering to take vegetable waste and the like, plus the offer of quality compost not only reduces potential fly breeding sites within the community, it also displaces fly breeding fertilization methods that have historically been used.
- Bio-Organics can and will offer a genuine solution to the important and sizable poultry industry that requires a viable and sustainable treatment option for spent hens, layer and broiler manure. The compost process will convert this material to stable, beneficial soil products. Gingin is a critical location for agribusiness and the location of this plant allows for a Gingin solution and opportunity to a Gingin problem.

Composting and recycling are *essential services* required in the Shire of Gingin and are rural activities that benefit the community.

- Access tracks. Generally 6m wide, a one-way truck route shall be built using locally sourced gravel to permit road-train vehicle access to and from the compost pad. Existing tracks shall be upgraded to suit vehicle traffic. Signage shall be erected to direct traffic appropriately.
- Evaporation ponds. Storage of approved liquids in evaporation ponds shall occur via concrete pits and pipes located adjacent to the compost pad. A 50,000 cubic metre plastic lined pond is already constructed and it is proposed to build 3 smaller ponds to accommodate separate wastewater streams.
- Greasetrap separator. For grease trap not immediately recycled in the compost, a treatment plant shall be used to separate lipids and solids prior to discharge into the evaporation ponds. The grease trap separator shall allow tankers to discharge into concrete tanks and allow for 3-day emergency storage in an adjacent plastic-lined pond. Grease trap shall be cleansed of lipids (dissolved and undissolved) using a dissolved air flotation system to remove lipids which shall be collected for recycling/composting. Cleaned water shall then move on to the evaporation pond awaiting ingress to the composting plant on demand.
- Site facilities. A site office, bathroom, machinery workshop and related buildings shall be temporary in nature (i.e. transportable). Communications shall be using mobile services. Power shall be linked to the adjacent supply used for the pig sheds. Water shall be provided by an on-site potable water tank and pump. Wastewater shall be managed with a septic tank.

There are no permanent buildings and no application is proposed to be made for a local government building licence. If required, an application for a wastewater treatment apparatus shall be submitted to accommodate the proposed septic tank to service the site office.

#### 2.4 PLANT & EQUIPMENT

Non-fixed plant proposed to be used shall be as follows (the quantity and type may vary over time):

- Compost turner (self-propeller, high-speed drum turner) to aerate compost windrows.
- Frontend loader for materials handling, loading, etc.
- Excavator for materials handling, loading, shaping windrows, etc.
- Bobcat for housekeeping and keeping the compost pad clean.
- Watercart for dust control and applying water to compost rows.
- Trucks for carting material in and out of the facility (various sizes and configurations).
- Grinder for processing greenwaste prior to forming windrows or manufacturing specific-size mulches.
- Screen for processing finished compost into specified particle sized product.
- Site facilities (as detailed in the above section).

Proposed fixed plant shall be:

- DAF greasetrap separator (as detailed in the above section).

Plant and equipment are serviced, maintained and stored on or adjacent to the compost pad.

Fuel, oil and other chemicals used for machinery operation are managed in accordance to DEC criteria for the storage and use of hydrocarbons.

#### 2.5 INGREDIENTS & PRODUCTS

Manufacturing composts, soils and mulches requires the ingress of various ingredients; in turn, finished product is exported from the site.

Details of proposed inputs are as follows:

- Shredded greenwaste (primary source of carbon). This being the predominant ingredient. Expected volume circa. 30,000 - 50,000 t.p.a.
- Nitrogenous solid wastes. Those wastes that are compostable such as food-stuffs, vegetable matter, manure, maltings sludge, other food wastes, spoiled fertilisers, etc. Expected volume of circa. 10,000 – 20,000 t.p.a.
- Benign solid wastes. Non-biodegradable wastes, which after being broken down, are beneficial for the soil. Including bentonite clays, plasterboard and other minerals. Expected volume of circa. 5,000 – 10,000 t.p.a.
- Nitrogenous liquid wastes. Bulk liquids, predominantly water, that contain biodegradable contaminants that are non-toxic, digestible by compost microorganisms and do not contain elevated concentrations of heavy metals, hydrocarbons, salts or pesticides. These include grease trap, pond water and stormwater and some washdown from industry processes. Other wastewater suitable for composting shall be either directly applied to a composting row or diverted to ponds for recycling during summer. These include treated greasetrap, saline water and some washdown from industry processes. Expected volume circa. 30,000 – 50,000 ton p.a.
- Other liquid wastes beneficial for plant health after composting, including phosphoric acid and ink-press wash. Small volumes only.
- Blending ingredients which are not composted. Including peat, sand and sawdust which are sourced from local quarries and suppliers for the purpose of creating soil mixes when blended with compost.

The very nature of a commercial recycling facility means that the volume and type of ingredients is subject to fluctuation and will not necessarily be consistent throughout the year. For example, a one-off project might create a spike in a certain waste; or the need to take advantage of available greenwaste as and when it becomes available.

Bio Organics has built its reputation on being very selective on what is accepted or rejected from its composting process. There are potentially thousands of different solid and liquid wastes which can be composted. Only those that improve the compost process, are easily biodegraded and benefit the end product which are accepted into the facility.

For the management of bio-security risk, Westpork (as the operators of the adjacent piggeries) has retained the right to veto inputs should they pose any health and wellbeing risk to its animals.

All inputs to the facility are covered by a DER operating licence to ensure that the categories of waste treated and recycled at the facility are those that are appropriate to the process and do not pose an amenity or environmental risk.

It is not possible to specifically list all the potential inputs for composting expected to become available in the next 20+ years. DER works approvals covers many of these in its table of *controlled waste categories*. Those categories shall be listed on the works approval sought by Westpork in consultation with Bio-Organics. The critical issue is *how* inputs with risk are handled by the composting operation. These are covered in Section 3 below and form part of the ongoing DER's monitoring and relicensing process

## 2.6 OPERATION TIMES

Day-to-day composting related activity using traditional earthmoving machinery will be undertaken from 7:00am to 5:00pm Monday to Saturday. No works on Sunday, public holidays or after hours unless occasional special circumstances are required. Special circumstances would include the management of any environmental conditions which required immediate attention, or the receipt of an occasional time-sensitive

### 3 COMPLIANCE & PROTECTION

#### 3.1 TPS COMPLIANCE

As detailed in section 1.4 above:

- The site is located within the Shire of Gingin's *Local Planning Scheme No. 9 District Zoning Scheme* ("TPS9"). The proposed compost facility development is on land zoned "General Rural".

As excerpted from TPS9:

The objectives of the General Rural Zone are to:

- (e) manage land use changes so that the specific local rural character of the zone is maintained or enhanced;
- (f) encourage and protect broad acre agricultural activities such as grazing and more intensive agricultural activities such as horticulture as primary uses, with other rural pursuits and rural industries as secondary uses in circumstances where they demonstrate compatibility with the primary use;
- (g) maintain and enhance the environmental qualities of the landscape, vegetation, soils and water bodies, to protect sensitive areas especially the natural valley and watercourse systems from damage; and
- (h) provide for the operation and development of existing, future and potential rural land uses by limiting the introduction of sensitive land uses in the General Rural zone

Composting, recycling organic waste and manufacturing quality soils and mulches for garden and horticulture use is a use consistent with the objectives of the General Rural zone therefore should be favourably considered as meeting the objective of TPS9. Citing specific examples:

- a. Composting facilities receive and recycle bulk organic wastes generated from rural activities such as land clearing and garden maintenance, recycle crop trash and grain dust, and recycle manure and waste fertiliser;
- b. Compost facilities manufacture compost, soils and mulches needed in horticulture, gardens and other farming activities (such as vineyards). Good quality compost improves soil health, restricts disease, reduces water demand and 'makes plant grow'.
- c. Composts, soils and mulches are environmentally sustainable and beneficial in application – including farming and similar rural pursuits. Those benefits include improving soil quality, increasing micro-biological activity to stimulate for healthier crops with less fertiliser, reducing water usage through improving the moisture holding capacity of soil, capturing applied fertiliser for plant take up and reducing it from leaching into ground water, and much more;
- d. Mulch produced at compost facilities in accordance with Australian Standards helps to reduce the spread of weeds and plant diseases (such as *Jarrah Dieback*) by properly pasteurising greenwaste before it is used in the wider community;

Above all, the proposed compost facility is located immediately adjacent to Westpork's piggery. It is therefore located within the amenity impact footprint of the existing rural industry. Furthermore, the compost facility will directly support the piggery by safely, efficiently and sustainably recycling waste from the piggery as well as provide essential services for rural industry – both as a destination to recycle much of its wastes, but also in manufacturing products to benefit rural, agriculture and farming pursuits.

The Westpork piggery has insufficient available water to sustain a compost plant. Liquid waste is therefore a critical element to obtain essential moisture for composting. As required under the DER licence, only elements that are beneficial to the composting process will be ingressed into the composting system. The

use of waste for this process is a responsible and necessary part of the process and adheres to current state and federal waste and recycling guidelines.

### 3.2 ENVIRONMENTAL COMPLIANCE

This section investigates the risk associated with the proposed development which may affect the environment or amenity of the residents living in the neighbourhood; and how those risks are to be mitigated or eliminated.

#### 3.2.1 DUST MANAGEMENT

Dust lift-off is a potential risk for composting activities exposed to prevailing winds and is within impact distance from dust-sensitive receptors (such as residential dwellings). The ingestion, inhalation or eye-contact of dust particles associated with soil is a potential human health risk and that risk is to be assessed and mitigated.

In accordance with DEC: *A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities*, a *Site Classification Risk Assessment* has been conducted for the proposed activities (found at Appendix B). The resulting classification type is "Classification 1 (considered negligible risk)". Accordingly, the recommended Provisions and Contingency arrangements for dust control are assessed as "none required".

Over and above the DEC guidelines for dust control the following circumstances are to be considered.

Dust becomes airborne when fine and light particles of soil (sand, compost, etc) are dry and exposed to prevailing winds of sufficient strength. The proposed compost facility is located within an existing pine plantation. It is concealed by dense mature pine trees and well protected from prevailing winds.

Composting is a wet/moist activity. While being manufactured or matured, compost is formed into windrows of up to three metres in height - which can be exposed to wind where not buffered or screened. Even if exposed to prevailing winds, compost is a blend of coarse particles ("mulch") and fine particles ("compost fines"). Coarse particles are not a dust lift-off risk while compost fines are maintained at a high moisture content (>25%) as part of the manufacturing process. Therefore those fine particles are suppressed. Wet/moist windrows also provide additional wind-screening to adjacent floor areas which are trafficked by machinery.

Furthermore, the site is located in a semi-remote region. Nearest dwellings are over 3km away and are not affected by the composting activities. The site is under current rural industry landuse (large intensive piggery) and is located adjacent to the Shire of Gingin gravel pit and potential future refuse facility.

For use as employee housing, 3 dwellings are located in the southeast corner of the site. With a distance of approximately 800m and screened by dense pine plantation for that entire distance, the likelihood of amenity impact from the compost facility is negligible.

In summary, composting produces no dust because it is wet. Dust suppression in traffic areas is part of the daily operation of any composting facility.

#### 3.2.2 ODOUR MANAGEMENT

Odour from noxious industry (as well as other rural activities) can cause significant amenity impact. Subject to how activities are conducted, composting can cause offensive odours if not managed properly.

The impact of that odour is respective to the location of odour sensitive premises. As detailed in section 1.3, there are no odour sensitive receptors within 3km of the proposed compost facility (being one dwelling at 3.4km and one dwelling at 7.0km). The site is semi-remote and far from urban, semi-urban or rural living. Most importantly, the existing intensive piggery has already established an odour buffer around the site of 3.5km. The EPA *Guidance for the assessment of environmental factors – Separation Distances between Industrial and Sensitive Land Uses* recommends compost facilities to have a buffer distance of 150, 500 and 1,000m for various forms of composting. The existing buffer distances far exceed those recommended buffer distances. Therefore, odour from the compost facility is not expected to create any amenity impact.

Regardless of the odour buffers, the following applicable details can also be considered with regards to odour.

Compost, like most quality soils and mulches, has an 'earthy' odour which is non-offensive. However, the process of making that compost can produce a very offensive odour as it can include the use of highly offensive waste. Odour can be generated from two factors – the type of composting and how ingredients are handled.

a. Aerobic composting.

The two common forms of composting are anaerobic and aerobic. The former is conducted in an oxygen starved environment such as a static pile or enclosed vessel where anaerobic (smelly) bacteria thrive in breaking down the waste. The latter requires oxygen for aerobic bacteria to survive – achieved by regular aeration of the compost. Both processes need the right balance of moisture and carbon:nitrogen ratio.

The primary offensive odour in composting and decomposing waste is the volatilisation of nitrogen in the form of ammonia. Raw manure, rotting vegetables, dead animals, septic waste and static compost bins (anaerobic) create that odour. However, a balanced composting process which promotes aerobic bacteria has an almost immediate and opposite effect as nitrogen is quickly consumed by the thermophilic activity which prevents the escape of offensive ammonia gas.

To demonstrate this action, Bio-Organics conducted an Odour Study in 2002 to prove the ability of a good composting process to mitigate odour – even when composting highly-offensive material. The details and summary of that odour study is found at Appendix C.

The proposed composting activity, as described in Section 2 above, is aerobic in nature. It is the simple process of mixing wastes (which may be odorous) with active compost and sufficient shredded greenwaste which effectively and quickly mitigates odour. Regular aeration (mechanical turning) of active compost rows ensures that anaerobic activity is prohibited.

b. Just-in-time waste handling.

The second odour risk when composting is how ingredients are handled. Decomposable wastes such as food and manure can be extremely odorous when left exposed to the open environment. To eliminate that risk, the proposed composting activities shall undertake a just-in-time waste handling process.

Bio-Organics shall not stockpile or store any waste or ingredient on the site which, when left to the environment, could create offensive odour. All potentially offensive liquid and solid wastes are received at the facility and immediately applied/mixed with greenwaste and active compost rows. Liquid wastes shall be discharged into prepared compost rows and covered. Solid wastes such as maltings sludge shall be unloaded and immediately mixed with greenwaste.

Immediately covering offensive odour wastes with greenwaste and then allowing aerobic composting to commence is an efficient and effective way to suffocate odorous wastes and stop their potential to release odour. Thereafter, thermophilic bacteria go to work to breakdown that waste.

An exception to the above is when potentially odorous liquid wastes stored in evaporation ponds are subject to the creation of odour. In those cases, the physical location and buffer distance to sensitive odour receptors satisfactorily mitigates the potential for amenity impact and are not addressed in this point (b).

### 3.2.3 NOISE MANAGEMENT

Machinery (engine) noise is produced during compost activities. However, as already covered above, there are no sensitive receptors (residential dwellings) located near the site (the closest being 3.7km away).

Vehicle traffic on Wannamal Road West will be increased by the ingress of ingredients and output of product sales. However, Wannamal Road West has just 2 rural dwellings along its 11km length from Brand Hwy to the Site. That road is already under traffic load from existing industry (Westpork's piggery, Marley piggery, Shire of Gingin's gravel pit, Oil/Gas mining facility) and therefore no significant change to amenity impact is expected.

### 3.2.4 VISUAL AMENITY MANAGEMENT

The proposed activity is nestled in a rural landscape, in a semi-remote area and far from public roads, or public amenities. The compost facility is to be constructed within a pine plantation which will effectively conceal its activities. There is no visual amenity impact

### 3.2.5 PUBLIC SAFETY

Public are not openly invited to the facility and public access is restricted. Furthermore, the compost facility shall be a discrete activity located far from residential land uses or public recreation.

No "public welcome" advertising or signage shall be erected.

No dangerous or explosive goods shall be used or stored at the facility.

There are no significant hazards at the facility other than trip hazards and stockpiles of soil.

Operational safety includes the use of high visibility PPE. Any invited person (member of the public or other guest) to the facility shall wear the minimum PPE and/or be accompanied by trained site personnel.

The site and the operational area are surrounded with rural-type fencing.

The site is located more than 500m from any public road.

### 3.2.6 VEGETATION PROTECTION

For the construction of the compost pad, a portion of approximately 6 hectares of pine plantation shall be cleared. The plantation is not protected vegetation and there is no presence of declared rare fauna or flora.

Pine trees cleared for the compost pad construction shall be stockpiled for recycling (grinding and composting).

### 3.2.7 AIR, SOIL & GROUND WATER PROTECTION

Composting by open-windrow (aerobic) processes is exposed to the open environment. It occurs in the open air and on the ground. Therefore the natural air, soil and ground-water environments must be protected.

- a. Protecting the Air.  
Composting is a 'hot' process whereby thermophilic bacteria digest and breakdown carbon in a moist and oxygen rich environment. This process releases water in the form of steam which emanates from active compost piles and is not hazardous. Composting is not an air-polluting activity.
- b. Protecting the Soil.  
Composting activities are physically separated from the natural ground by way of a 300mm thick pavement. That hard-stand is made of gravel, rock and clay to provide a strong trafficable surface, a pad to compost on, and a barrier between compost and the natural ground. Suitable treatment of the hard-standing as defined by the DER and a civil engineer shall be incorporated in the design to achieve permeability that does not exceed  $10^{-9}$  m/s.
- c. Protecting the Groundwater.  
Stormwater or liquid waste spillage may contain nutrients and other contaminants which must be prevented from entering the environment and contaminating natural ground water. This is achieved by the construction of the compost pad and connecting drainage system as follows:
  - Pad is constructed with low permeability materials (gravel and clay) to prevent vertical infiltration as well as having a PE liner;
  - The area is not subject to seasonal flooding and has a deep natural ground water level (>20m);
  - Pad floor is engineered with slope to divert excess water or spillage to a PE sealed stormwater/leachate dam where it is recycled into the composting process;
  - Earthen bund is constructed to the immediate perimeter of the pad to restrain water leaving the pad area.

The implementation of these protection measures creates a separation of the proposed activity from the environment.

### 3.2.8 VERMIN & FLY CONTROL

Poorly managed rural activities can create breeding grounds for vermin such as rats and mice, while decomposing materials such as manure are a haven for flies to breed. It is noteworthy that one of the largest environmental/amenity issues affecting the shire is the control of stable/biting flies. This is one of the most compelling reasons for the composting facility in Gingin.

The proposed activities shall mitigate the ability for vermin and flies to breed through the following processes:

- a. Potential food sources for vermin are not stockpiled at the facility. As detailed in section 3.2.2 above, wastes shall not be temporarily stockpiled. Rather, all wastes are either unloaded directly into compost rows and processed, or are unloaded and immediately blended with greenwaste.
- b. Breeding grounds for flies in stockpiles of compost are only of risk when odorous wastes are not aerated. As described in section 3.2.2 above, the proposed composting process is aerobic – one that requires regular turning of compost to facilitate conditions for aerobic bacteria to thrive. Not only do those bacteria quickly consume wastes which may attract flies, they create an environment where insect larvae cannot survive. Thermophilic bacteria cause compost to become very hot very fast (nominally 60 degrees within a matter of hours and up to +80 degrees within 24 hours). These environments kill insects and their larvae as well as plant/weed seeds and pathogens/fungi such as *phytophthora cinnamomi* (aka *Jarrah dieback*). Furthermore, regular turning of rows eliminates stockpile surfaces from allowing insect larvae/eggs from maturing. The compost facility becomes an effective 'fly trap' by removing these insect eggs and larvae from the breeding cycle.

### 3.3 FIRE, CHEMICAL, ACCIDENTS AND VANDALISM RISK MANAGEMENT

Fire prevention and control: The proponent shall reduce the risk of fires from exposed flames or spontaneous combustion by the implementation of the following procedures and working conditions:

- (1) Fire Fighting equipment - Permanent watercart is based at the facility for normal operation tasks, along with an overhead fast-flow filling tower, trailer mounted fire-fighting units and fire extinguishers. These items of plant are ready and available for immediate and effective fire fighting.
- (2) No naked flames – no open flames or smoking is permitted on the compost facility or near any flammable substance.
- (3) Stockpile management – stockpiles of combustible material (raw dry greenwaste) shall be separated from any activity which might generate excessive heat. These stockpiles shall also have sufficient spaces to allow for heavy machinery and fire-fighting equipment to access the stockpile.
- (4) Temperature management – all stockpiles of material are to be regularly temperature checked. Stockpiles which consist of dry carbon (predominantly fresh greenwaste and mulch) are to be kept below 65°C. This is achieved by regular turning and managing stockpile height and age. Once material is formed into active compost rows, moisture content varies from 40%-60%, which is too wet to combust, even at high temperatures.
- (5) Machinery maintenance – operator responsibilities shall include the daily inspection of vehicles for dust, debris or greenwaste which may catch on fire during the machine operation. Regular high-pressure cleaning shall be carried out by the operator.
- (6) During adverse weather conditions (notably extreme fire-danger and high temperatures) water carts and fire-fighting units shall remain on stand-by during and after hours (24 hours/day) and ready to be employed should a fire occur.

Chemical Spills: There are no hazardous chemicals proposed to be stored at the facility. Fuel shall be stored in double-skinned tanks to prevent hydrocarbon spillage.

Accidents: Accidental spills of solids and liquids at the facility are managed by the hardstand and recycled from the drainage system back into the compost. Solids spills are collected with loaders and other earthmoving machinery. Liquids spills are soaked up with fresh greenwaste and put into active compost rows.

Acts of Vandalism: There are no elements of the proposed composting facility with which a vandal (deliberate or accidental) would risk the contamination of ground water. There is no storage of wastes other than greenwaste.

### 3.4 COMPLAINTS HANDLING

The mitigation of social impact from any industrial development must include a prescribed process to handle complaints. Complaints shall be handled by Bio-Organics in the same manner as non-conformance procedures.

The compost facility shall have Bio-Organics undertake and make available the following complaints handling mechanisms:

- a. Availability for contact. Contact information shall be published on the internet and telephone directory for public access. The site office located in an accessible location should complaints be made in person and attended during normal business hours.
- b. Personnel charged with the task of handling complaints. The business office shall nominate an authorised officer capable of understanding and handling complaints and acting on them in an appropriate manner. That person shall nominally be the *office manager*. Complaints shall be received in a respectful manner to ensure the complainant is clear that their concern is received and will be attended to promptly. The office manager shall be in attendance or available during the normal business days/hours to be able to receive any complaints.
- c. Complaints shall be detailed in a *Non-Conformance Report* which shall document the details of any complaint, investigation carried out and what action is taken. Coupled with the Non-Conformance Report shall be a Non-Conformance Register to table complaints. The Non-Conformance Register shall be kept up to date and available for inspection by designated authorities if and when required (copy attached at Appendix D). The complaints register shall form part of Westpork's annual DER compliance report;

The procedure for complaints handling shall generally be as follows:

1. Complaint is received and details of complainant and their complaint shall be written down. If relevant, prevailing weather conditions shall be documented at the time of receiving the complaint;
2. The office manager shall contact the operations manager and/or company director to advise them of the complaint. Any or all three of these persons shall investigate the complaint. The investigation shall include an immediate review of current activities and if they may have caused the offence;
3. Any need for action with regard to odour or dust will be implemented by the Site Manager immediately. This may include the temporary secession of works until the offending activity is overcome.
4. Within 1 business day the complaint shall be thoroughly reviewed against operational activities to determine if changes need to be implemented to avoid the offence occurring again;
5. All action, outcome and follow up shall be documented on a non-conformance report and reviewed by senior management;
6. If requested, the complainant shall be contacted after the offence has been resolved and advised of action taken;

#### 4 SUMMARY

This document has been prepared to support the approval to conduct composting and related activities at Lot 10 Wannamal Road West, Gingin. It has detailed the proposed activities and protection measures to mitigate any negative impact to the environment or amenity of the community. Moreover, the proven track record of The Operator (Bio-Organics) adds substantial confidence for the Shire to approve an environmentally sustainable and important activity to support rural industry. Bio-Organics has been operating a commercial compost facility in Oakford for over 12 years and is very experienced in handling the proposed wastes and activities in an industry-best-practise manner.

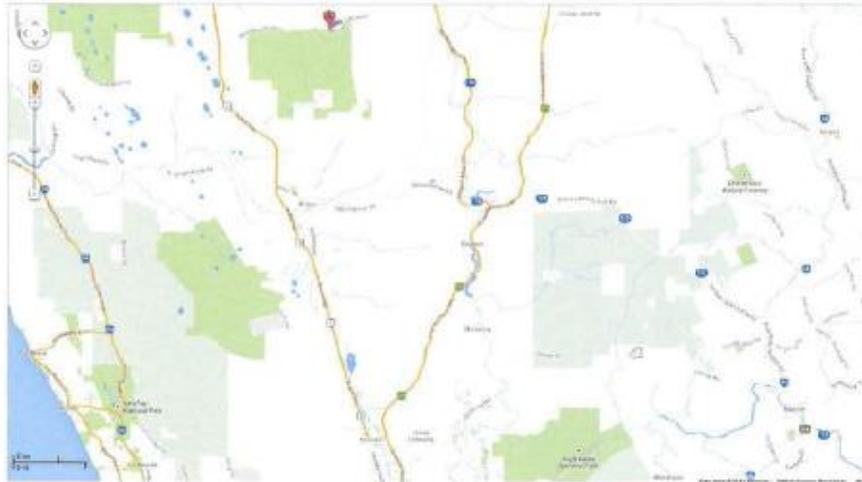
The proposed composting/recycling activities precisely fit current federal and state government policy objectives in relation to waste management, pollution prevention and soil conservation. Furthermore, products manufactured by a compost facility are specifically used by the primary sector of the economy. Bio-Organics makes its soils, mulches and potting mixes from recycled ingredients which are reused locally and state-side in agricultural, horticultural and farming industries.

The proposed location in Gingin is ideal in that:

- It is compatible and complementary to the licensed piggery.
- It is in an area that is unlikely to be subjected to encroachment from lifestyle or development blocks.
- It is supportive and complimentary to significant regional agribusiness.
- It is able to deal with all of the Shire's green waste efficiently.
- It can make a significant impact on the current stable fly problem.
- It is potentially a significant local employer that will generate employment in Gingin.

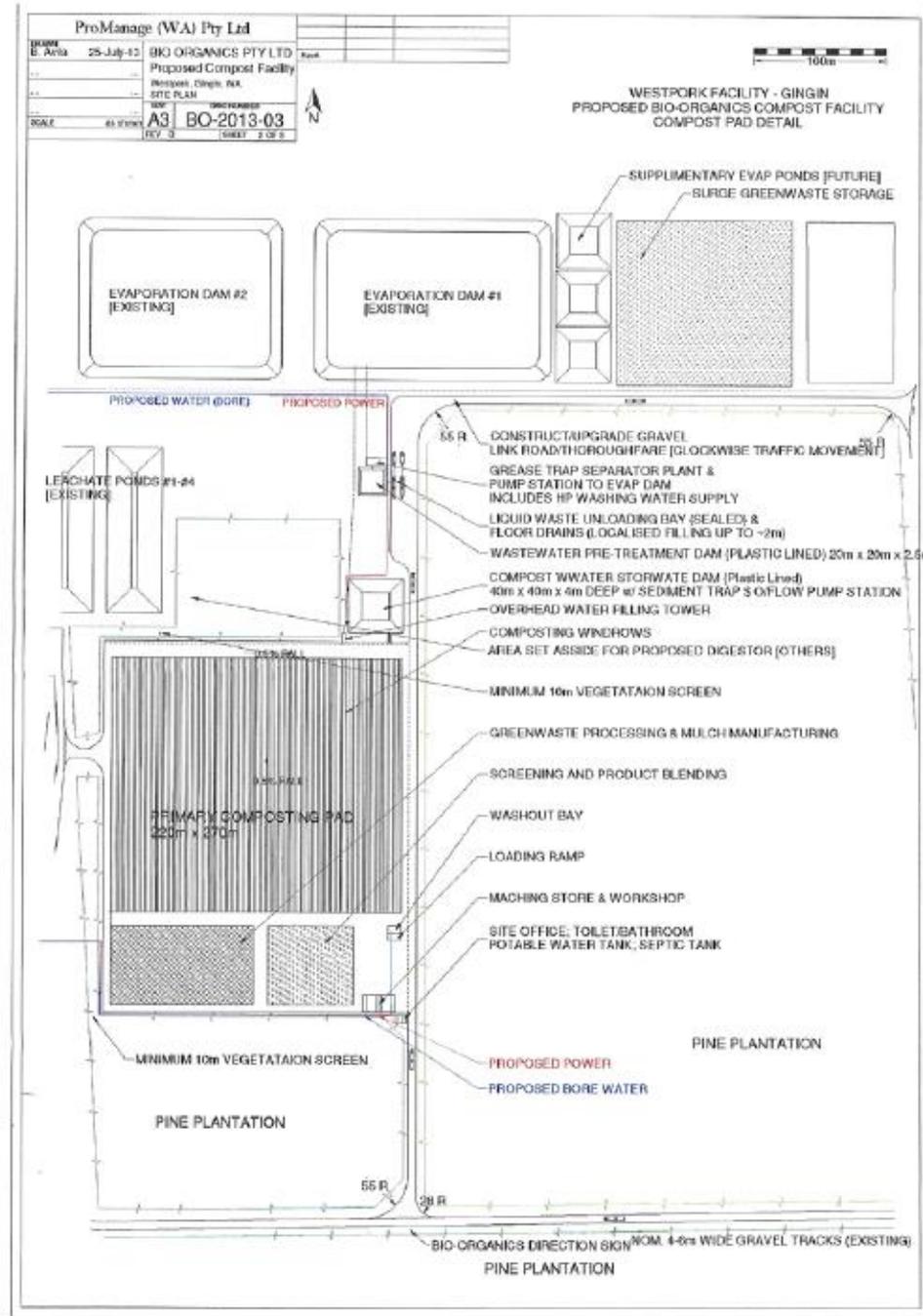
**Appendix A**

**Location Plan, Site Plan and Construction Plan**



**LOCATION PLAN**

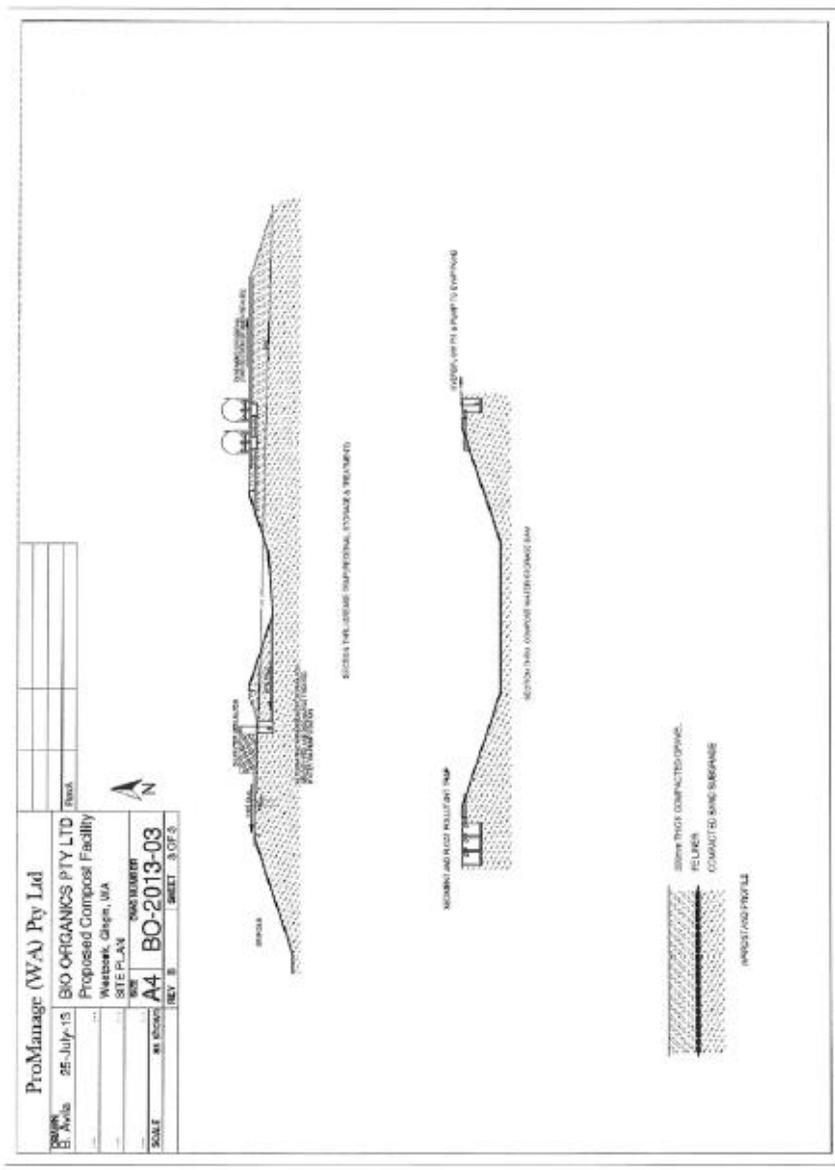




Bio-Organics

Proposed Compost Facility - Gingin

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Proposed Compost Facility – Gingin

Bio-Organics

**Appendix B**

**Site Classification Assessment (Dust)**

DEC: *A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities.*

**Sheet 4: Dust management and monitoring requirements for each site classification score**

Based on the total score obtained from the 'SITE CLASSIFICATION ASSESSMENT CHART' and notwithstanding any allowance for special site conditions during the dry period, (refer to Note 4, Appendix 1) the following site classification will apply:

- Site classification 1 — under 199;
- Site classification 2 — 200 to 399;
- Site classification 3 — 400 to 799, and
- Site classification 4 — over 800.

**Note:**

- Unique sites may need special assessment.
- It is essential that any contracts for construction work on site include the relevant contingency arrangements appropriate for The Site classification.

**Classification 1 (score under 199, considered negligible risk)**

Provisions:

- None required.

Contingency arrangements:

- None required.

**Classification 2 (score between 200 and 399, considered low risk)**

Provisions:

- The developer shall supply a contingency plan to the local government, which shall detail the activities to be undertaken should dust impacts occur.

Contingency arrangements:

- Include an allowance for water-cart operation, wind fencing and surface stabilisation during the construction period for the purposes of dust suppression.
- All areas of disturbed land should be stabilised to ensure that the disturbed area exposed at any time is kept to a practical minimum.

Monitoring requirements:

- Complaints management system in place (complaints recorded and acted on promptly).
- Notice to be erected at The Site, providing contact details of the person to be contacted and works.

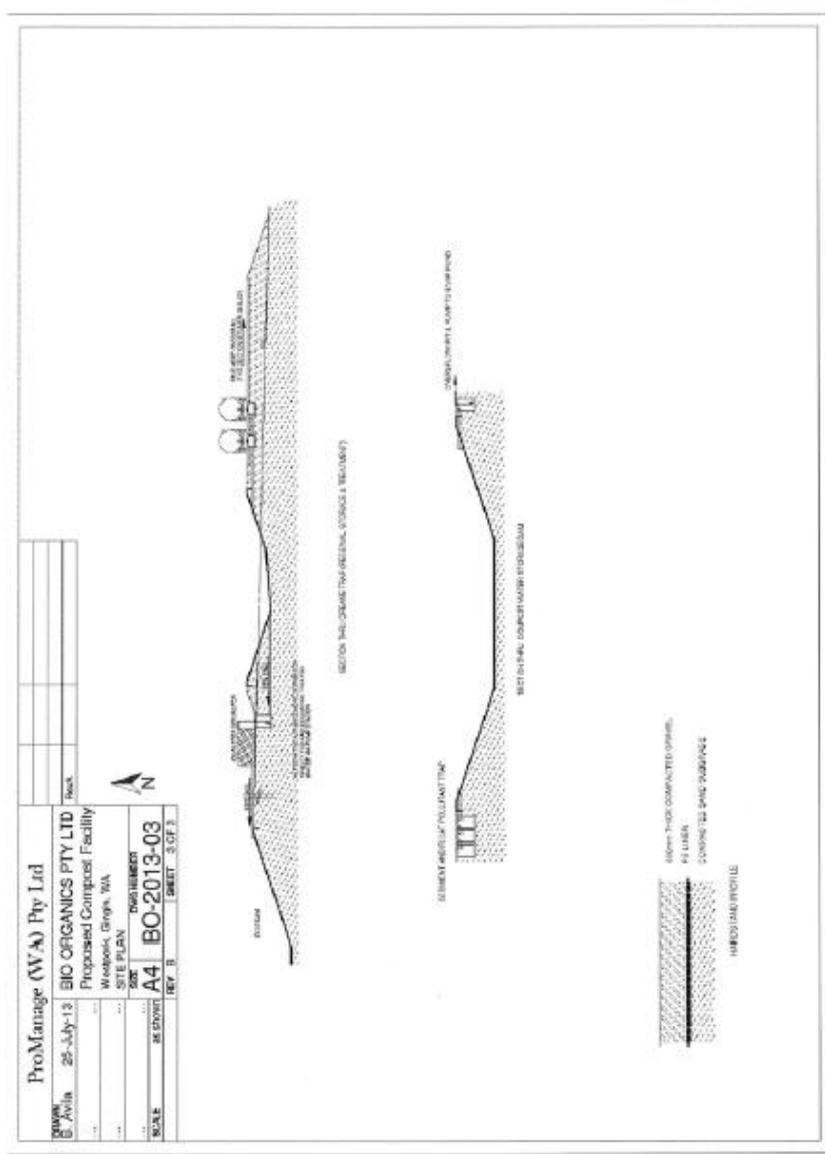
**Classification 3 (score between 400 and 799, considered medium risk)**

Provisions:

- Appropriate wind fencing of a length specified in the air quality management programme needs to be stored on site or available within one hour of being required by the engineer for the developer/local government/DEC.
- All areas of disturbed land should be stabilised to ensure that the disturbed area exposed at any time is kept to a practical minimum to prevent exceeding of dust standards (see Section 4.4.2).
- The engineer for the developer shall maintain close control of works with dust creating potential (for example, allowable length of open trenching).
- After all site works are completed, and before the contractor has vacated The Site, the developer should ensure that the entire site is stable. The developer then retains responsibility for site stability until change of ownership/control takes place. After the change of ownership/control has taken place, the new owner or controlling party will inherit responsibility for site stabilisation.

Contingency arrangements:

- Suitable water-carts in good working condition and of not less than 10,000 litres capacity per 7.5 hectares of disturbed site, or other suitable alternatives, shall be available to commence watering on The Site within 18 hours of being required to do so by the engineer for the developer/local government/DEC.
- Surface stabilisation equipment shall be available to commence operation on site within 48 hours of being required to do so by the engineer for the developer/local government/DEC and with sufficient capacity to cover the disturbed site area within a further 48 hours.



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Proposed Compost Facility – Gingin

Bio-Organics

- Wind fencing shall be erected within 18 hours of the contractor being required to do so by the engineer for the developer/local government/DEC. Dust generating works on The Site shall cease in the interim.
  - If dust-related complaints are generated due to activities on The Site, the developer may be required by the local government or an authorised DEC officer to distribute advisory notices to adjoining land occupiers within 48 hours. A notice form is provided in Sheet 5 of Appendix 1.
  - If dust-related complaints are generated due to material which has been excavated for trenching, the developer shall ensure this material is stabilised within 48 hours of being requested to do so by the engineer for the developer, local government or an authorised DEC officer.
  - Include an allowance for water-cart operation, wind fencing and surface stabilisation during the construction period for the purposes of dust and wind-borne material suppression.
  - Include an allowance for surface stabilisation for the purposes of dust and wind-borne material suppression to be maintained after the construction period and until change of ownership/control takes place.
- Monitoring requirements
- Site dust management system in place.
  - On-site dust monitoring against short term criteria.
  - Off-site (compliance) dust monitoring at site boundary (if close to sensitive receptors) or at sensitive receptors. See Section 4 and Appendix 4.
  - Complaints management system in place (complaints recorded and acted on promptly).
  - Exceeds to be reported to the relevant authority – DEC, Local Government or DOH.
  - Notice to be erected at The Site, providing contact details of the person to be contacted regarding the works.

**Classification 4 (score over 800, considered high risk)**

## Provisions:

- Advisory notices shall be issued to adjoining land occupiers, the local government and the DEC at least 48 hours before site works commence. The notices shall include the name of the developer, engineer for the developer, contractor/s, contract period, contact telephone numbers of The Site engineer and local government environmental health officer as detailed in Sheet 5 of Appendix 1.
  - Fencing to the extent and in locations agreed to by the developer and local government shall be erected before any part of The Site surface is disturbed.
- Note: This provision does not necessarily mean that the total site boundary is to be fenced. The fence is to be installed to an extent which will protect adjacent land uses and in most cases should be erected on the edge of the area which will be disturbed rather than on The Site boundary.*
- An amount of wind fencing of a length specified in the air quality management programme needs to be stored on site or available within one hour of being required by the engineer for the developer/local government/DEC.
  - The nominated wind fencing is to remain in position until the disturbed surface is stable.
  - Surface stabilisation is to be applied to the disturbed area of each section of The Site upon completion of the works in that section.
  - The engineer for the developer shall maintain strict control of works with dust-creating potential. Material which has been excavated for trenching shall be stabilised if the trench is to be left exposed for longer than 72 hours.
  - After all siteworks are completed, and before the contractor has vacated The Site, the developer should ensure that the entire site is stable. The developer then retains responsibility for site stability until change of ownership/control takes place. After the change of ownership/control has taken place, the new owner or controlling party will inherit responsibility for site stabilisation.

## Contingency arrangements:

- Suitable water-carts in good working condition and of not less than 10,000 litres capacity per 5 hectares of disturbed site, or an appropriate alternative, shall be available to commence immediate watering on The Site.
- Surface stabilisation equipment shall be available to commence operation on site within 48 hours of being required to do so by the engineer for the developer/local government/DEC and with sufficient capacity to cover the disturbed site area within a further 48 hours.
- Additional wind fencing shall be erected within 18 hours of the contractor being required to do so by the engineer for the developer/local government/DEC. Dust generating works on The Site shall cease in the interim.
- Include an allowance for water-cart operation, wind fencing and surface stabilisation during the construction period for the purposes of dust and wind-borne material suppression.
- Include an allowance for surface stabilisation for the purposes of dust and wind-borne material suppression to be maintained after the construction period and until change of ownership/control takes place. Monitoring requirements as for Classification 3.

Sheet 1: Site classification assessment chart

Part A. Nature of site

Item	Score Options				Allocated Score	Comment
	Very low 1	Low 2	Medium 4	High 6		
1. Nuisance potential of soil, when disturbed		Medium screening 6	Little screening 12	Exposed and wind prone 18	2	Compost is a wet process. Bulk materials are maintained at high moisture content (score of 1). Small volumes of soil can be dislodged from machine wheels onto access road which can become dry seasonally (score of 2).
2. Topography and protection provided by undisturbed vegetation	Sheltered and screened 1				1	Works area is surrounded by dense pine plantation screen.
3. Area of site disturbed by the works	Less than 1ha 1	Between 1 and 5ha 3	Between 5 and 10ha 6	More than 10ha 9	1	Area disturbed by machines or traffic at any given moment is less than 1ha.
4. Type of work being done	Roads or shallow trenches 1	Roads, drains and medium depth sewers 3	Roads, drains, sewers and partial earthworks 6	Bulk earthworks and deep trenches 9	6	Works are bulk soil handling and stockpiling and a level surface.
<b>TOTAL score for Part A</b>					<b>10</b>	

**Part B. Proximity of site to other land uses**

Item	Score Options				Allocated Score	Comment
	More than 1km	Between 1km and 500m	Between 100m and 500m	Less than 100m		
1. Distance of other land uses from site	1	6	12	18	6	The only dwellings within 3km are three dwellings located south of the proposed compost facility, on the site and are used for housing employees for the piggery.
2. Effect of prevailing wind direction (at time of construction) on other land uses	Not affected	Isolated land uses affected by one wind direction	Dense land uses affected by one wind direction	Dense/sensitive land uses highly affected by prevailing winds	6	See above comment.
<b>TOTAL score for Part B</b>					<b>12</b>	

<b>SITE CLASSIFICATION SCORE (A X B) =</b>	<b>120</b>	<b>Classification 1 – Negligible Risk</b>
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## Appendix C

### **Odour Study**

An Odour Study and Odour Modelling investigation, funded by the Department of Environment, has been undertaken at the proposed compost facility in 2001 and 2002 when, under its current DA, commercial composting was occurring. Works were carried out by the independent research firm, Bioscience Pty Ltd, who were successful in obtaining funding from the DEC's *Waste Management and Recycling Fund*. Along with its director, Dr. Peter Keating, an environmental consultant, Environmental Alliance, was engaged to conduct specialised olfactometry analysis to verify findings.

The purpose of the study was to test the key factors of composting – being moisture content, aeration and C:N ratio – on preventing odour impact when incorporating highly offensive odorous ingredients (a.k.a. biological activators) with greenwaste.

The odour impact study pushed the boundaries of composting highly offensive odorous ingredients using necessary microbial accelerants but at very high rates to try to get the composting process to produce refractory odours. The conclusion was that, even at very high concentrations of these odorous materials in proportion to greenwaste, no unacceptable odours were produced if the composting process was maintained to minimum criteria of moisture content and to a lesser degree, C:N ratios.

The study was deemed of importance as the results could have a direct bearing on regulations, policy and process for the waste industry with an overt goal to reduce the volume of waste going to landfill and the social need to develop those activities which do not create detrimental social and environmental impacts.

The details and results of the Odour Study were staged in Milestones:

**Milestone 3 – odour analysis from windrow composting greenwaste with high-odour nitrogenous waste at optimal conditions. The following key conclusions were realised:**

- The trials were conducted using various nitrogenous wastes, but reverted to using a maltings' sludge with high levels of nitrogen, phosphorous, sulphur and iron. It was noted as having an "intense and obnoxious odour". Analysis of the volatile organics showed ammonia, putrescine and pentamethylene diamine as major nitrogenous odour components, and ethanethiol and mercaptoethanol as the major sulphur-containing components.
- The reason for using the particular nitrogenous waste for odour trials was because it was deemed to be similar in analysis for biosolids (excluding their heavy metal salts) and manure, but exhibited a stronger odour. As the report states:

"This does not compromise the trial program as [the sludge waste] has much higher odour potential than poultry or pig manure."

Therefore the odour study is applicable to both the current composting activity which incorporates maltings' sludge, and the proposed DA which seeks to use manure as an ingredient.

- Freshly blended ingredients of greenwaste (compost substrate) and odorous waste (maltings' sludge) at a 20:1 ratio of Carbon: Nitrogen and having a 45% w/v moisture content emitted no detectable odour when turned regularly (daily). As the report states:

"Although it was expected that greenwaste would significantly reduce odour, it was not anticipated that odour would be completely eliminated."

- Analytical sampling of odour was hindered from composting related activities because of high moisture. However:

"The lack of recovered organics, although hindered by methodology, may have been due to the fact that none were emitted. This was consistent with dynamic olfactometry (i.e. smelling the piles) where windrows became essentially odourless immediately after incorporation of sludge into greenwaste with a single pass of a windrow turner. The only odour detectable was a mild 'earthy' smell. Such smells are associated with geosmin. This compound could not be detected by HPLC, however the human threshold odour concentration is 0.1 ppb, which is below the analytical detection limit."

**Milestone 4 - odour analysis from windrow composting greenwaste with high-odour nitrogenous waste at unbalanced conditions. The following key conclusions were realised:**

- To vary the trials and validate the results of Milestone 3 and 5, new trials attempted to unbalance the compost process by varying moisture content and C:N ratio. The trials tested for odour one day after turning. Only where moisture content exceeded 70% and C:N ratio fell to below 10:1 was offensive odour detectable at a distance of 10 meters.
- These results were validated by balancing the unbalanced compost by the reduction in moisture and the addition of greenwaste. The results being that the following day, odour was eliminated.
- The significant findings were that greenwaste can effectively absorb odour, even if the C:N ratio is well outside of normal ration of 40:1. However, if moisture content is greater than 70%, windrows become odourous, even at very high C:N ratios.

**Milestone 5 - odour modelling (olfactometry study) around the operating compost facility. The following key conclusions were realised:**

- The results of odour modelling were as follows:
  - Environmental Alliances used dynamic olfactometry to examine odour emission from the Oakford Organics process at early, mid and late stages, coupled with direct on site odour assessment during the time when odour hazard was at a maximum.
  - Their report confirms the analytical results that any discernible odour was eliminated. Their conclusions was that the odour was significantly less than what would be expected from a natural eucalyptus forest, in other words, it was less than background odour found in a natural wilderness. The report concludes that the established methodology for determining appropriate buffer distances (dispersion modelling) cannot work for Oakford Organics, for the levels of odour as so low that natural background emissions provide too large an interference for any meaningful conclusions. The report states, "The implications of this is that the EPA's criterion for acceptable odour impacts become particularly stringent for composting odours, which does not appear to be sensible."

**The conclusion of the odour study states:**

"The outcome of this study is that Oakford Organics has developed, then independently verified a system of composting refractory organic waste which completely eliminates the major environmental concern about composting, being the generation of offensive odour. The key to this development is recognising the remarkable property of greenwaste to absorb and chemically bind the elements of nitrogen and sulphur such that they are unable to

become electron acceptors in biological oxidations, and thereby eliminate odour potential. The practical implications of the study have had an immediate impact on landfill reduction."



## Appendix 2: Key Documents

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**Table 23: Key Documents**

	Document Title	Availability
1	Works Approval W5632/2014/1 Mindarra Farm Piggery composting approval	der.wa.gov.au
2	Licence L5274/1993/11 Mindarra Farm Piggery	der.wa.gov.au
3	DER <i>Guidance Statement on Regulatory principles</i> (July 2015)	der.wa.gov.au
4	DER <i>Guidance Statement on Setting conditions</i> (September 2015)	
5	DER <i>Guidance Statement on Licence duration</i> (November 2014)	
6	DER <i>Guidance Statement on Licensing and works approvals processes</i> (September 2015)	
7	DER <i>Guidance Statement on Land use planning</i> (October 2015)	

## Appendix 3: Summary of Applicant's Comments on Risk Assessment and Draft Amended Conditions

**Table 24: Summary of correspondence dated 1 August 2016**

Comments	DER's consideration of comments
<p><b>Impact on Viability of Operations</b> Westpork expressed concern with DER's decision to initiate an amendment of the Works Approval issued in March 2016. The draft amendments have a significant impact on the proposed activities at the Premises and the viability of the proposed composting operation.</p>	<p>Noted. DER undertakes its regulatory functions in accordance with <i>Guidance Statement: Regulatory principles</i>.</p>
<p><b>Amendments are unjustified</b> Westpork contended that there is no change to the proposed construction or operation of the facility or the level of risk to justify the decision to initiate the amendment of the Works Approval. There is also nothing in the Decision Report to indicate the availability of new information or evidence that would substantially alter the level or risk previously assessed, requiring significant amendments to the Works Approval.</p> <p>There was evidence that the draft Environmental Standard was being considered throughout the assessment of the works approval granted in March. Westpork contended that the draft standards do not represent 'new' information since the decision was made to issue the Works Approval in March.</p> <p>Westpork contended that the proposed amendment to the works approval is unjustified, inconsistent with other similar licensed premises and the Department's own environmental standards and without sound basis.</p>	<p>Noted. In accordance with section 59(2) of the EP Act, a works approval may be amended on the initiative of the CEO. As per the correspondence dated 11 April 2016, the CEO requested a review and consequent amendment of the issued Works Approval to take into consideration a number of matters not considered by the Delegated Officer at the time and to reconsider matters which were documented by the Delegated Officer.</p>
<p><b>Availability of sufficient wastewater supply from the piggery</b> Liquid waste inputs from sources other than the Piggery are required to ensure sufficient water for both operations as well as the financial viability of the composting operation. In the absence of approval to accept liquid wastes from other sources, the composting facility will be unviable and there will be insufficient liquids available from the piggery to support the operation.</p>	<p>Noted.</p>
<p><b>Liquid waste benefits and regulatory controls</b> Westpork contended that adequate evidence has been provided that the liquid waste proposed to be accepted are of benefit to the composting</p>	<p>Noted. The Delegated Officer has revised the Decision Report and notes that the Environmental Standard for Composting will be finalised soon and will apply to existing and new</p>

Comments	DER's consideration of comments
<p>process as outline in the works approval application. Westpork advised that it is aware of at least two other licences prescribed for categories 67A and 61 where the same waste types are approved and therefore precedence exists for the acceptance of these types of wastes and their regulation by regulatory controls.</p> <p>Precedence therefore exists for the acceptance of these types of wastes in other composting operations and the regulation of those wastes through licence controls (i.e. specification of waste approved to be accepted, maintenance of records of accepted waste, limits on quantities of wastes accepted and process outputs monitoring and limits).</p> <p>Westpork contended that the proposed amendments to the Works Approval are excessive and not commensurate with the level of risk described in the Decision Report. Sufficient regulatory control can be applied through the operating licence without the need to restrict the acceptance of liquid wastes from outside sources.</p>	<p>composting facilities.</p> <p>All Category 67A prescribed premises will be reviewed against the Environmental Standard: Composting.</p>
<p><b>Risk of odour impacts</b></p> <p>The proposed composting operation is located adjacent to the Mindarra Farm Piggery. Westpork asserted that DER's change in position regarding odour impacts from the composting operation are unreasonable considering the following facts:</p> <ol style="list-style-type: none"> <li>The distance to the nearest sensitive receptor (single residence) is 3.7km away;</li> <li>The proximity to the piggery and its existing large liquid waste evaporation ponds;</li> <li>No odour complaints have been made regarding the piggery;</li> <li>Controlled liquid wastes brought to the compost facility are not proposed to be stored at the site, rather, applied to compost immediately upon receipt;</li> <li>EPA's assessment when prescribing a default odour buffer for a composting facility is 1km.</li> </ol> <p>Westpork also provided with respect of cumulative impacts, the odour from the current piggery operation will dominate odour emissions from the combined facilities. The cumulative effect of the odours over the effect of the impacts of the existing piggery are not likely to be substantial, given the very different nature of the odours. The cumulative separation distance is consequently unlikely to be significantly more</p>	<p>Noted. There is the potential for more odorous emissions to occur from the facility due to:</p> <ul style="list-style-type: none"> <li>the large quantities of liquid waste proposed to be composted;</li> <li>the uncertainty around the specific types of liquid waste; and</li> <li>the lack of a quality (fresh) water source for the composting process.</li> </ul> <p>In respect of cumulative emissions DER is aware of odours which have been identified at distances of over 8km from similar co-located premises with a similar throughput as those proposed.</p> <p>No changes have been made in respect of the risk of odour.</p>

Comments	DER's consideration of comments
than that required for the piggery.	
<p><b>Odour risk rating</b></p> <p>Westpork noted that based on the assessment undertaken, the risk rating was found to be Moderate. This was inconsistent with the risk assessment Table 17 which identified the risk as high.</p>	<p>It is noted that the summary table in the Decision Report (Table 17) was incorrect at the time of issuing to Westpork for comment and that the correct risk rating for odour is as described in section 8.6 of the Decision Report. Specifically, the risk of odour has a consequence rating of moderate and a likelihood rating of possible giving an overall risk rating of moderate.</p>
<p><b>Pathogens and contaminants</b></p> <p>Given the nature of the activities on site the identified level of risk in relation to workers at the Mindarra Farm Piggery and biosecurity at the piggery from airborne pathogens or contaminants are considered to be overstated. Westpork provided a response in respect to impacts tot end users, biosecurity at the piggery and impacts to workers at the piggery:</p> <p><i>Impacts to end users:</i></p> <p>Westpork provided, that the final product is required to meet the specifications within AS4454:2012. Compliance with these standards can be achieved through the application of conditions within an operating licence relating to monitoring and quality specifications with reporting of outcomes. Given this, Westpork provided that they do not consider this to be a matter that cannot be adequately addressed through the operating licence.</p> <p><i>Biosecurity at the piggery</i></p> <p>Westpork advised that the key biosecurity risk associated with piggeries is the spread of disease from pig to pig. No waste from any external piggeries will be permitted to be brought to the facility. Additionally, waste is not permitted to become 'airborne' due to liquid waste application directly into rows of compost and moist soils are not at risk of dust lift off. Westpork provided that the airborne pathway between waste and the piggery operation is unlikely and the level of risk assessed in the Decision Report is considered to be unjustified.</p> <p><i>Impacts to workers at the piggery</i></p> <p>Westpork noted the following:</p> <ul style="list-style-type: none"> <li>• Composting is a wet/moist activity. No water (including liquid wastes) is added to maturing/mature compost.</li> <li>• Coarse particles are not at risk of dust lift-off while compost fines are maintained at a high moisture content (&gt;25%) as part of the manufacturing process.</li> </ul>	<p>Noted. The Delegated Officer has further considered this information (section 8.8) and revised the Decision Report and Amendment Notice accordingly.</p>

Comments	DER's consideration of comments
<ul style="list-style-type: none"> <li>Waste is not permitted to become airborne (see above)</li> </ul> <p>Westpork contend the airborne pathway between waste and humans is unlikely and the level or risk assessed in the Decision Report is considered to be unjustified.</p>	
<p><b>Inadequate Consultation</b></p> <p>Westpork is of the view that consultation undertaken by DER leading to the draft amendment was inadequate and not consistent with what was outlined by the CEO when the process was initiated. Westpork has not been consulted in relation to the specifics of the review or the proposed amendments prior to receipt of the recent correspondence. Westpork submits that the DER has not followed a procedurally fair and reasonable process in progressing the amendment.</p>	<p>DER extended the consultation period to allow extra time for consideration of the proposed amendments.</p>
<p><b>C:N Ratio control</b></p> <p>Westpork provided that the 4:1 ratio discussed in the Application is not the proposed C:N ratio, but rather the mix of green waste to manure. It is recognised that appropriate C:N ratios are in the order of 25-30.</p> <p>Westpork provided that the C:N ratio that will be applied in the proposed composting process will be significantly higher than 4:1 and probably no lower than 25:1. The actual value will depend on the relative proportions of the various inputs, their densities, and specific composition.</p> <p>Feedstocks from each source or aggregated supplies will be tested prior to ingress to assist in defining a C:N ratio to enable successful composting and to minimise associated issues such as odour generation. The outcomes of this assessment process can be provided to DER on request.</p>	<p>Noted. The Delegated Officer has taken this information into consideration and amended the Decision Report accordingly.</p> <p>The anticipated C:N ratios of solid and liquid waste feedstocks and how the C:N ratio to be maintained between 25 and 35:1 has not been satisfactorily addressed in the works approval Application and will need to be demonstrated in the licence application.</p> <p>The licence application will have to demonstrate the process control on how optimum ranges (including but not limited to C:N, moisture, etc.) for the composting process will be maintained. Conditions may include monthly reporting on feedstock waste testing and calculations to demonstrate compliance with the ratios proposed within the application</p>
<p><b>Removal of any reference to treatment of grease trap waste (representing 80% of maximum volume intake)</b></p> <p>The original application proposed a Dissolved Air Flotation (DAF) separator for the treatment of grease trap wastes that are not able to be immediately recycled in the compost. Westpork submits that the treatment of grease trap waste is not required prior to use within the composting process and this type of waste (without further treatment) is utilised as an input to the composting process at other facilities.</p> <p>Westpork provided that grease trap wastes are proposed to be added to the compost rows as</p>	<p>Noted. The Delegated Officer has revised the Decision Report and Amendment Notice in respect of the direct application of grease trap waste to composting windrows.</p>

Comments	DER's consideration of comments
<p>they arrive on site removing the requirement for the DAF separator for management of these wastes prior to integration within the compost rows.</p>	
<p><b>Lack of quality water</b> Stormwater from the hardstand and direct rainfall will be collected, stored and used in the manufacturing process; therefore 'quality' water is available to facilitate the operation.</p> <p>Westpork submits that 'quality' water is however not required as part of the composting process. Westpork noted that no water (quality water or not) is added to maturing/mature compost.</p> <p>Westpork submits that no controlled (liquid) wastes will be added to the composting process during the maturing/mature compost and therefore the reference in the Decision Report to "re-contaminating" the compost does not have any basis.</p> <p>Westpork advised that the final product will not be made available for public use unless tested for compliance with the criteria defined in AS4454-2012.</p>	<p>Noted. The Delegated Officer has further considered this in section 3.2.3 of the Decision Report.</p>
<p><b>Planning approval</b> Westpork questions whether the condition proposed achieves the requirements of Section 62 of the EP Act as it does not relate to the prevention, control, abatement or mitigation of pollution or environmental harm. Westpork is aware that it is required to obtain the necessary planning approval prior to works commencing and contends that this is not a matter that is appropriately regulated in the works approval.</p>	<p>The Works Approval was granted on 31 March 2016 by a Delegated Officer under section 20 of the EP Act. Table 1 details the Prescribed Premises Categories and production quantities approved in the Works Approval. These capacities are lower than what was applied for; the throughputs which were approved in the Works Approval were consistent with the Shire of Gingin approvals, in accordance with DER's Guidance Statement on Land use planning (October 2015).</p>
<p><b>Assessment of operator</b> Westpork will retain possession and control of Lot 10 during construction. The proposed operator of the composting facility is aware that under section 57 of the EP Act they are required to lodge the necessary application for the operating licence and their suitability as the operator, is a matter for the subsequent operating licence. Westpork contends that the future operator of the facility should have no bearing on the decision outcomes for the works approval.</p>	<p>Noted. The operating aspect is a highly relevant consideration that informs requirements of the Works Approval. In accordance with procedural fairness obligations it would not be considered fair for both companies if DER did not take into consideration the operator at the granting of an instrument.</p>

**Table 25. Summary of correspondence dated 10 October 2016**

Comments	DER's consideration of comments
<p><b>Wastewater calculations</b>                      The key assumptions used in the calculation process are incorrect as it assumes:</p> <ul style="list-style-type: none"> <li>i. The ongoing volume of wastewater for shed flushing will remain constant. Incorrect: During the 2015 reporting period Mindarra 4 had 15 operational sheds. The facility's design capacity is for 19 completed sheds. Aurora correspondence was based on the facility being fully operational at 19 sheds, not the 15 sheds being reported on in the 2015 AER; and</li> <li>ii. The volume of wastewater directed to the effluent system is equal to the volume of wastewater recycled for shed flushing. Incorrect: Piggeries use fresh water for drinking and cleaning purposes which leaves the sheds in the form of urine and wastewater. The outflow of wastewater directed to the effluent system will always exceed the volume of water used to flush the sheds. Furthermore, the volume of water available for flushing purposes due to evaporation. Whereas the calculations undertaken assumed the volume entering the system less the volume used for flushing is available for the composting operation.</li> </ul> <p>[Westpork provided detail and examples as to how DER's theoretical calculations do not accurately reflect the availability of water from the Piggery].</p> <p>Westpork's continued position is that the composting facility is intended to be an independently viable operation that can use, but does not rely, on wastewater from the piggery. Westpork's position is entirely consistent with DER's own management and licensing of a composting operation adjoining a commercial piggery of similar nature to Westpork's.</p>	<p>Noted. The Delegated Officer has taken this information into consideration and amended the Decision Document and Amendment Notice accordingly.</p>
<p><b>Controlled liquid waste testing regime</b>                      [The types and potential/likely sources of controlled liquid wastes that would be accepted were outlined in the response as an attachment]. A full list of every chemical that would be acceptable is not possible to be provided as there are thousands of chemicals that are beneficial or benign for plant growth and the composting process and are too numerous to specify all of them. However, the process by which each</p>	<p>As detailed, the anticipated C:N ratios of solid and liquid waste feedstocks and how the C:N ratio to be maintained between 25 and 35:1 has not been satisfactorily addressed in the works approval Application and will need to be demonstrated in the licence application.</p> <p>The licence application will have to demonstrate the process control on how optimum ranges (including but not limited to C:N, moisture, etc.)</p>

Comments	DER's consideration of comments
<p>potential liquid waste will be assessed for suitability as outlined in the Liquid Waste Management Plan (attached to Applicant's response).</p> <p>The assessment process considers:</p> <ul style="list-style-type: none"> <li>• water content;</li> <li>• ingredients beneficial for composting or compost including microbial accelerator, bacterial food sources, minerals, nutrients and nitrogenous substances, acids and low concentration elements which improve the quality of the finished composted soils;</li> <li>• licensing;</li> <li>• site capability and compatibility (the composting process requires a balance of inputs)</li> <li>• contaminants (if PAH's or heavy metals exceed a concentration level that would result in a concentration of contaminants in the finished compost of &gt;50% of the limit according to Australian Standards AS4454-2012, then the waste shall be rejected).</li> </ul> <p>Waste providers need to provide test results with the above information for consideration in the pre-approval process. Every waste type needs to be tested and if multiple loads are to be accepted the repeat testing is required every ten loads. Copies of all test results and delivery dockets shall be kept at the Head Office of the licensee for a period of 7 years and made available to DER on request. Any non-conformance or licence breach will be reported to DER by the Licensee.</p> <p>Westpork is accepting of the fact that conditions surrounding the acceptance of specific liquids; testing; reporting volumes and non-conformance reports will form part of the operating licence, issued by the DER to the operator of the site.</p>	<p>for the composting process will be maintained. Conditions may include monthly reporting on feedstock waste testing and calculations to demonstrate compliance with the ratios proposed within the application</p>
<p>DER was always aware of the intended operational parties; both during the assessment phase and when the decision was made to issue Westpork with the Works Approval.</p> <p>DER determined the suitability of the operator is a licensing matter not a matter for the Works Approval. Given the DER's position on this there is no reason to consider amending the current Works Approval. DER was aware of the operator when making its decision.</p>	<p>As per the response in Table 24.</p>
<p>The proposed changes to liquid waste inputs seriously affects the operational and commercial</p>	<p>As per the response in Table 24.</p>

Comments	DER's consideration of comments
viability of the facility and are inconsistent with other licensed premises.	
DER's technical rational for the calculation of the wastewater availability from the piggery is flawed as discussed above. Limited volumes are available as part of the desludging process, leaving a significant deficiency of water which can only be supplied by external means.	Noted. The Delegated Officer has taken this information into consideration and amended the Decision Document accordingly.
Any concerns about the future operator and the sources, nature and volumes of particular liquid input should be addressed through the Licensing Approval process rather than amend the current Works Approval.	As per the response in Table 24.

# Attachment 1: Works Approval W5632/2014/1 Amendment Notice No.1

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