Government of Western Australia
Department of Environment Regulation

Works Approval

Environmental Protection Act 1986, Part V

Works Approval Holder: Westpork Pty Ltd

Works Approval Number: W5632/2014/1

Registered office: Unit 1, 7 Foundry Street
MAYLANDS WA 6051

ACN: 009 148 789

Premises address: Mindarra Farm Piggery
Lot 10 on Diagram 80101, Wannamal Road West,
GINGIN WA 6503
as depicted in Schedule 1.

Issue date: Thursday, 31 March 2016

Commencement date: Monday, 4 April 2016

Expiry date: Wednesday, 3 April 2019

The following category/s from the Environmental Protection Regulations 1987 cause this Premises to be a prescribed premises for the purposes of the Environmental Protection Act 1986:

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.	50 000 tonnes per year.
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.	1 000 tonnes or more per year.	80 000 tonnes per year.

Conditions of Works Approval
Subject to the conditions of the works approval set out in the attached pages.

Date signed: 31 March 2016
.....
Alan Kietzmann
Manager Licensing (Waste Industries)Officer delegated under section 20
of the *Environmental Protection Act 1986*

Works Approval Conditions

1 General

1.1 Interpretation

1.1.1 In the Works Approval, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 In the Works Approval, unless the contrary intention appears:

'Act' means the *Environmental Protection Act 1986;*

'annual period' means the inclusive period from 1 July until 30 June;

'CEO' means Chief Executive Officer of the Department of Environment Regulation;

'CEO' for the purpose of correspondence means;

Chief Executive Officer
Department Administering Environmental Protection Act 1986
Locked Bag 33
CLOISTERS SQUARE WA 6850
Email: info@der.wa.gov.au;

'Premises' means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Works Approval;

'Works Approval' means this Works Approval numbered W5632/2014/1 and issued under the *Environmental Protection Act 1986;* and

'Works Approval Holder' means the person or organisation named as the Works Approval Holder on page 1 of the Works Approval.

1.1.3 Any reference to an Australian or other standard in the Works Approval means the relevant parts of the standard in force from time to time during the term of this Works Approval.

1.1.4 Any reference to a guideline or code of practice in the Works Approval means the current version of the guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guidelines or code of practice made during the term of this Works Approval.

1.2 General conditions

1.2.1 The Works Approval Holder shall construct the works in accordance with the documentation detailed in Table 1.2.1:

Table 1.2.1: Construction Requirements[1]

Document	Parts	Date of Document
Compost Facility: Wannamal Road West, Gingin Works Approval Application Supporting Document, Rev 2,	All	4 November 2014

Table 1.2.1: Construction Requirements[1]		
Document	**Parts**	**Date of Document**
prepared for Westpork Pty Ltd by Strategen, November 2014.		
Letter to DER from Westpork: Environmental Protection Act 1986 – application for a works approval W5632/2014/1	All	24 February 2015
Works Approval Application Form	All	28 February 2014

Note 1: Where the details and commitments of the documents listed in condition 1.2.1 are inconsistent with any other condition of this works approval, the conditions of this works approval shall prevail.

1.2.2 The Works Approval Holder must ensure that the Works specified in Column 1 of Table 1.2.2 meet or exceed the specifications in Column 2 of Table 1.2.2 for the infrastructure in each row of Table 1.2.2.

1.2.3 The Works Approval Holder must not depart from the specifications in Column 1 and 2 for the infrastructure in each row of Table 1.2.2 except:

a) where such departure is minor in nature and does not materially change or affect the infrastructure; or

b) where such departure improves the functionality of the infrastructure and does not increase risks to public health, public amenity or the environment;

and in accordance with all other conditions in this Works Approval.

Table 1.2.2: Works specifications	
Column 1	**Column 2**
Infrastructure	**Specifications (design and construction)**
1) Hardstand	(a) The composting hardstand must; (i) be constructed to an area of 3.6ha (approximately 220m x 170m) as depicted in the Site Plan in Schedule 1; and (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 (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 (iv) have a minimum 1% drainage gradient to ensure the free drainage of all leachate to leachate collection infrastructure; and (b) The non-composting hardstand must: (i) Be constructed to an area of 2.3ha as depicted in the Site Plan in Schedule 1; and (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. (iii) Will have a sand sub-grade compacted: a) to 95% Maximum Dry Density (MMD);and b) overlain by a gravel sub base of 150mm thick compacted layer compacted to 95% MMD; and c) With an additional gravel base-course 100mm thick compacted layer compacted to 95% MMD.

Table 1.2.2: Works specifications	
Column 1	**Column 2**
Infrastructure	**Specifications (design and construction)**
2) Leachate collection infrastructure	Leachate collection infrastructure that will collect all leachate from the composting hardstand and direct the leachate into the leachate dam must: a) Have an impervious ($1x10^{-9}$ 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 b) Have a seal between the hardstand and any bund kerbing that is impervious ($1x10^{-9}$ m/s).
3) Leachate dam	The leachate dam must be lined using a HDPE liner and must be constructed in accordance with the following specifications: a) A HDPE liner must have: a. a minimum thickness of 1.55 mm with heat welded joints; b. All seams and joins 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. c. have a permeability of less than $1x10^{-9}$ m/s; and d. be capable of maintaining that permeability for the working life of the pond. b) Constructed to a capacity of 3,300 m^3. 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.
4) Three new Water Balance Ponds	The ponds will be lined with HDPE to the following minimum specifications: a) coefficient of permeability of less than $2x10^{-10}$ m/s (ASTM method D4716) b) minimum thickness of 1.00 mm ±5% c) specific gravity of not less than 0.94 (ASTM method D1505) d) melt index of 0.05-0.30 grams in 10 minutes (ASTM method D1238, condition E 190/ 2.16) e) carbon black content of 2–3% (ASTM method D1603) f) minimum tensile strength at yield of 16 000 kN/m2, and 550 kN/m2 at break (ASTM method D638, type IV 2) g) minimum elongation at yield of 10%, and 300% at break (ASTM method D638). h) Pond batters will be at a 30% gradient to prevent liner slippage. i) All seams and joints will be continuous and overlapped by a minimum of 100 mm prior to joining. j) Each pond shall be constructed to a capacity of 3,300 m^3.
5) green waste surge area	For the surge green waste hardstand, located adjacent to the supplementary water balance ponds the following specification will apply: a) Sand sub-grade: In-situ sand subgrade will be graded and compacted to 95% MDD. b) Gravel base-course: A 150 mm thick layer of compacted gravel. Maximum particle size to be approximately 50 mm. Compacted to 95% MDD.

Table 1.2.2: Works specifications	
Column 1	**Column 2**
Infrastructure	**Specifications (design and construction)**
6) Loading Ramp	The loading ramp will be constructed such that: 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. 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. 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.
7) Washout Bay	The washout bay will be constructed such that: a) It will share a common (rear) wall with the loading ramp (1.8 m high). 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. c) Achieve a permeability of less than $1x10^{-9}$ m/s.

1.2.4 The Works Approval Holder must conduct the following construction quality assurance testing to ensure that the Works specified in Column 1 of Table 1.2.3 meet or exceed the specifications in Column 2 of Table 1.2.3 for the infrastructure in each row of Table 1.2.3.

Table 1.2.3: Construction Quality Assurance testing	
Column 1	**Column 2**
Infrastructure	**Specifications (testing criteria)**
1) Hardstands	The following compaction testing criteria will apply: • Sub-grade: Perth Sand Penetrometer, 1 test per 1,000 m^2 • Gravel sub-base: nuclear tests, 1 test per 4,000 m^2 • Gravel base-course: nuclear tests, 1 test per 2,000 m^2 • Bituminous concrete: Marshall Field Density tests, 1 test per 4000 m^2. Bituminous emulsion seal tests will be undertaken to the following criteria: • Class of bitumen and bitumen content tested to Australian Standard AS1160 and MRWA bitumen specification 511 - one test per batch. • Spray run sheet for bitumen application rates at 1.3 l/m^2 or 7 mm and 1.6 l/m^2 for 10 mm – one test per day • Permeability test – one test per run sheet – field standing head permeability test. Asphalt Concrete layer tests will be undertaken to the following criteria: • Batch sample of asphalt mix to Specification APWEA AAPA Rev 3 conducted at the manufacturing plant prior to delivery - one test per day. • Core sampling for density and thickness (Field Marshall Test) - one test per 4000 m2. Survey: • As-constructed survey of all completed hardstands, drains, roads and dams.

Table 1.2.3: Construction Quality Assurance testing	
Column 1	**Column 2**
Infrastructure	**Specifications (testing criteria)**
	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
Pond liners	For the construction of new ponds, the following liner testing criteria will apply: • All seams and joins should be constructed and tested as watertight over their full length using a vacuum test unit, air pressure testing or other approved method used in the HDPE membrane industry. Liners are to be certified by an independent engineer to validate design, specification, construction, and permeability after completion in accordance with Table 1.2.2

2 Information

2.1 Reporting

2.1.1 Subject to Condition 1.2.3, the Works Approval Holder must, at least 21 days prior to the commencement of the Works, provide to the CEO detailed engineering and construction drawings and plans that are certified by a suitably qualified professional engineer that each item of infrastructure specified in Column 1 of Table 1.2.2 meets or exceeds the specifications in Column 2 of Table 1.2.2 for the infrastructure in each row of Table 1.2.2.

2.1.2 The Works Approval Holder must submit a construction compliance document to the CEO, following the construction of the works.

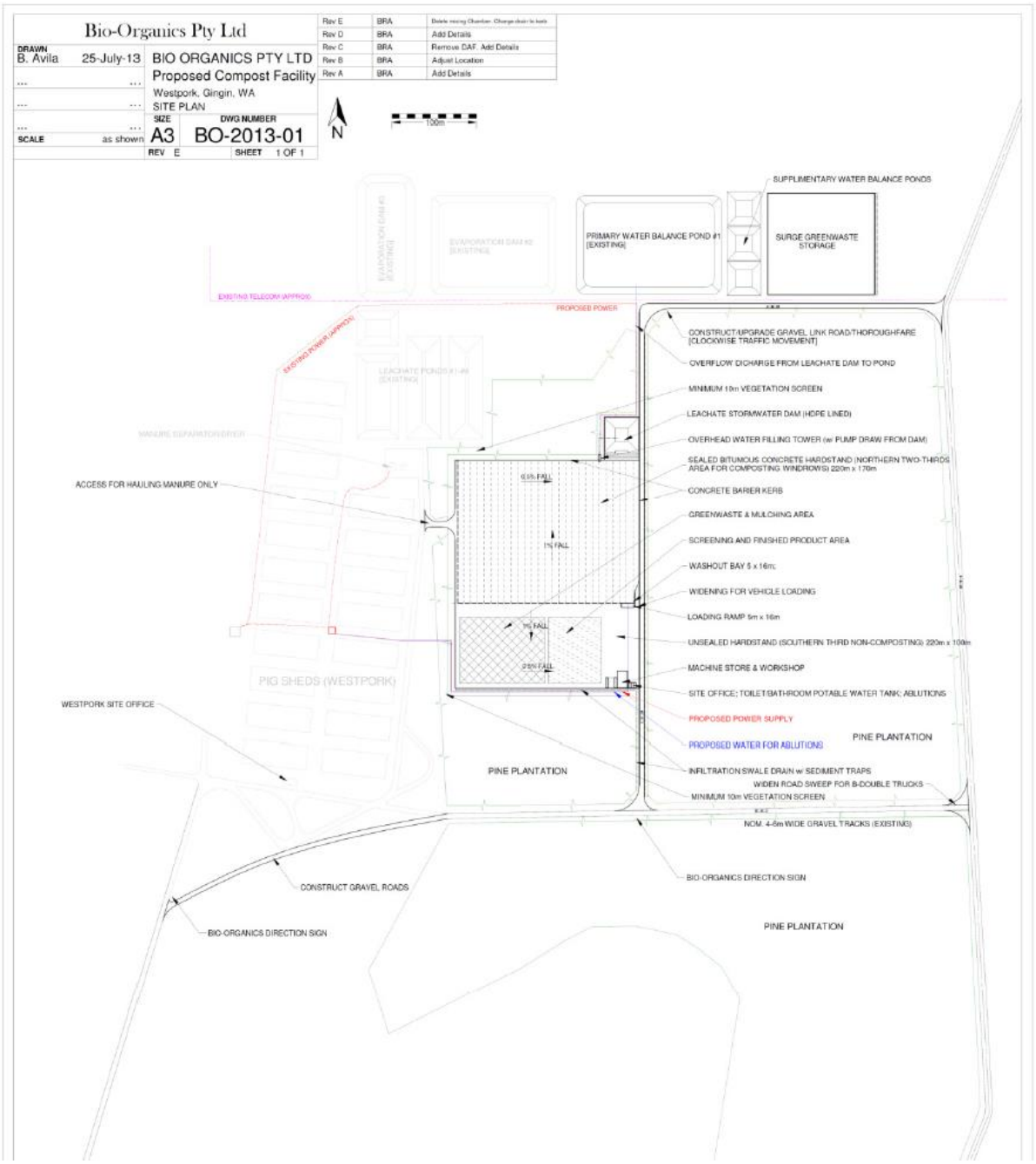
2.1.3 The Works Approval Holder must ensure the construction compliance document:
(a) is certified by a suitably qualified professional engineer or builder that each item of infrastructure specified in Condition 1.2.2, Table 1.2.2 has been constructed and tested in accordance with the Conditions of the Works Approval with no material defects; and
(b) be signed by a person authorised to represent the Works Approval Holder and contain the printed name and position of that person within the company.

Schedule 1: Maps

Premises map

The Premises is shown in the map below. The red line depicts the Premises boundary.

Proposed Site Plan



Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: **Westpork Pty Ltd**

Works Approval: **W5632/2014/1**

Registered office:	Unit 1, 7 Foundry Street MAYLANDS WA 6051
ACN:	009 148 789
Premises address:	Mindarra Farm Piggery Lot 10 on Diagram 80101, Wannamal Road West, GINGIN WA 6503
Issue date:	Thursday, 31 March 2016
Commencement date:	Monday, 4 April 2016
Expiry date:	Wednesday, 3 April 2019

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER) CEO's delegated officer has decided to issue a works approval. The delegated officer considers that in reaching this decision, he has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by:	Damian Thomas Licensing Officer
Decision Document authorised by:	Alan Kietzmann Delegated Officer

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1 Purpose of this Document

This decision document explains how the CEO's Delegated Officer has assessed and determined the application and provides a record of the decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative summary

Administrative details		
Application type	Works Approval ☒ New Licence ☐ Licence amendment ☐ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	61	50 000 tonnes per annual period
	67A	80 000 tonnes per annual period
Application verified Application fee paid	Date: 30/02/2014 Date: 02/04/2014	
Works Approval has been complied with Compliance Certificate received	Yes☐ No☐ N/A☒ Yes☐ No☐ N/A☒	
Commercial-in-confidence claim	Yes☐ No☐	
Commercial-in-confidence claim outcome		
Is the proposal a Major Resource Project?	Yes☐ No☒	
Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☐ No☒	Referral decision No: Managed under Part V☐ Assessed under Part IV☐
Is the proposal subject to Ministerial Conditions?	Yes☐ No☒	Ministerial statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☐ No☒ Department of Water consulted Yes ☐ No ☒	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒ If Yes include details of which EPP(s) here		
Is the Premises subject to any EPP requirements? Yes☐ No☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

Westpork Pty Ltd (Westpork) operates an intensive piggery at Lot 10, Wannamal West Road, Gingin, and currently holds a Part V *Environmental Protection Act 1986* (the Act) licence L5724/1993/11. Westpork (Applicant) proposes to develop a Composting Facility (CF) and associated infrastructure on a section of the Lot (adjacent to the current piggery operations) that covers approximately 10 hectares, causing it to be a 'prescribed premises' Category 61 Liquid waste facility and 67A Compost manufacturing and soil blending under Schedule 1 of the *Environmental Protection Regulations 1987*. Figure 1 provides a location map.

A general description of the range of CF activities comprising the project is as follows:

- composting green waste and carbon-rich wastes with various nitrogenous liquid and solid wastes (including pig carcasses and manure) to produce high-quality compost and soils for home, commercial and agricultural use;
- processing and pasteurising green waste to manufacture high-quality mulches for home, commercial and agricultural use; and
- soil blending for compost product.

The proposed CF will be located within a 45 hectare (ha) block currently containing a pine plantation that will require clearing of approximately 6ha. The CF will be separate to the piggery (screened with trees); only compostable wastes from the piggery will be transported to the CF. There will be no transfer of material from the CF to the piggery or into the piggery effluent management system.

Westpork is the proponent for the works approval will retain possession and control of Lot 10 during the construction phase of the proposal; they will be responsible for compliance with this approval.

Bio-Organics Pty Ltd (BO) has entered into an exclusive contractual relationship with Westpork to operate the proposed CF to be constructed by Westpork. BO will operate the compost facility as a tenant of Westpork. It is uncertain whether the licence will be issued to Westpork or BO, as the occupier of the site. A licence can only be issued to the person or company who is in control or occupation of the premises (the occupier). This issue will be resolved with the licence application (whether a new licence is issued, or the existing L5724/1993/11 licence is to be amended).

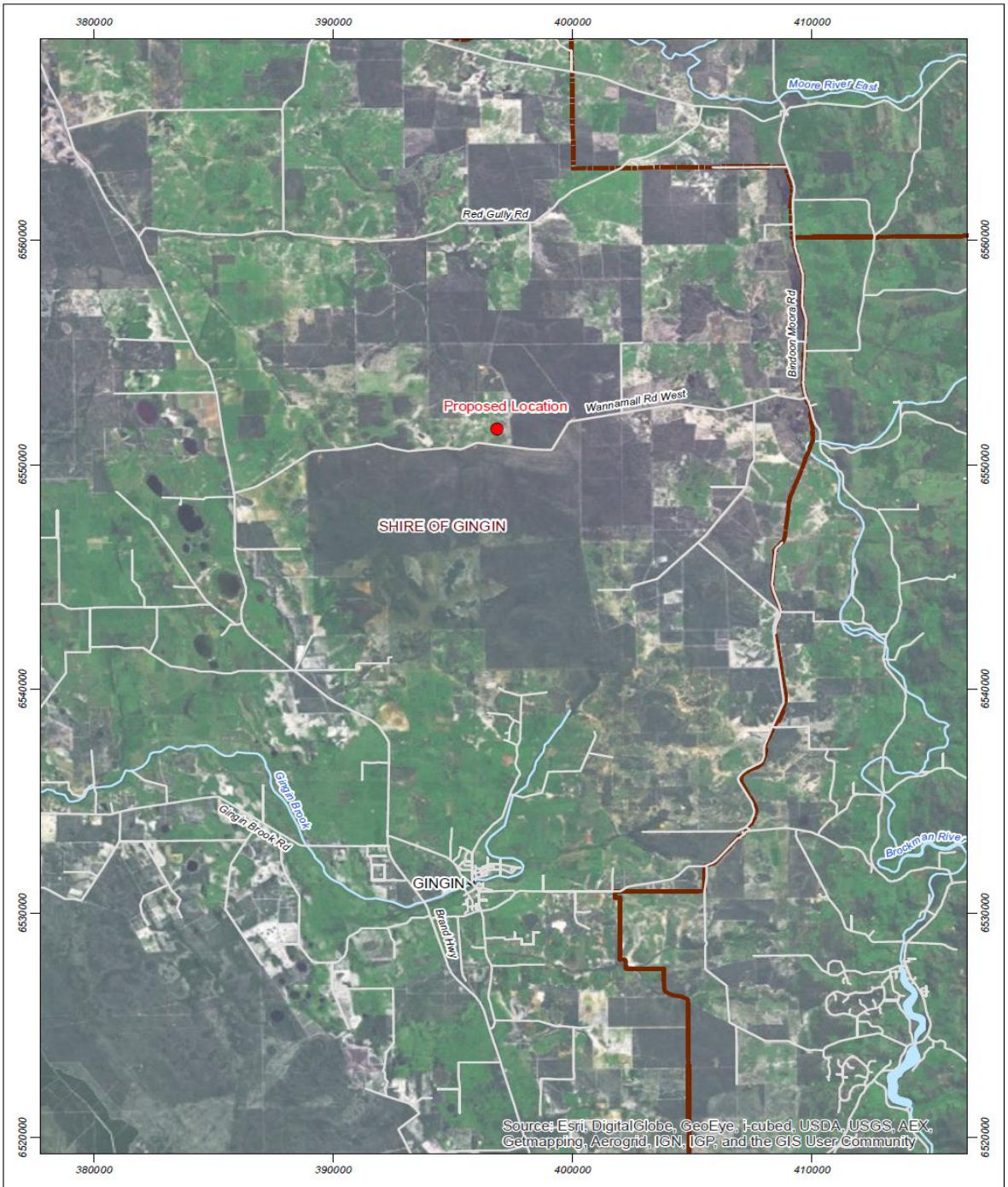
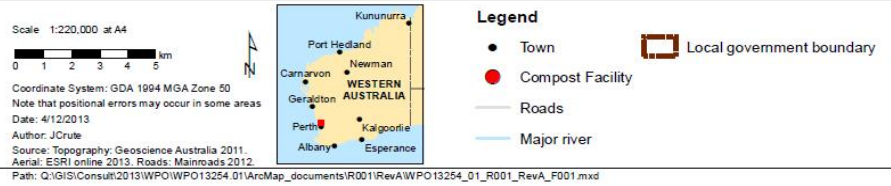


Figure 1 Locality Plan



This Decision Document is based on an assessment of the Applicant's application for *Composting Facility: Wannamel Road West, Gingin Works Approval Application supporting documents* dated November 2014, the Works Approval Application dated 28 January 2014 and the letter to DER dated 24 February 2015. The responses provided in the 24 February 2015 letter/responses clarify certain elements of construction as documented in the November 2014 application. While the assessment has been undertaken for a design capacity of 100,000 tonnes per year for the liquid waste facility, and 90,000 tonnes per year for the compost manufacturing and blending; the DER approvals are aligned to the Shire of Gingin planning approval of 50,000 tonnes per year and 80,000 tonnes per annual period respectively. These throughputs can be amended once the required planning approvals have been adjusted.

This Decision Document identifies the risks of the Application and the proposed controls for these risks. In Summary:

- The Works Approval will be granted subject to the controls and likely conditions for the Licence are described in section 4 of this Decision Document; and
- Westpork will be required to submit an application to amend the aforementioned licence to authorise the operational aspect of the CF, or if the occupier is different, an application for a new licence will be required prior to commencement of operation.

Location and siting

The CF premises location current features are:

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

- Hydrogeology: The site overlies the Perth Basin, which is a major sedentary 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. 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 rest of the Perth Basin. In this area of the Perth Basin, the significant groundwater resource (Leederville formation) occurs at substantial depth.

  Department of Water (DoW) notes that the nature and location of aquifers in the locality of the site may restrict their accessibility and availability. Stratigraphic logs from five bores located within the vicinity of the proposed CF were obtained from the DoW database. The bores were drilled into the Leederville formation to depths of between 128 and 144 metres below ground level (mbgl), 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. DoW results from a bore log close to the proposed CF advise depth to the regional groundwater is at least 78mbgl.

- Land use: The site is an Intensive Piggery offensive trade industry.

- Topography: The topography is predominantly flat with an average height varying from 195.0 to 210.0 mAHD. An elevated hill is located to the mid-west side up to 239.0 mAHD.

- Zoning: The overall site comprises approximately 421 ha of zoned rural land, currently used partly for offensive trade industry (intensive pig farming) and a pine tree farm. Access to the site is via a crossover located on Wannamal Road West. The site is located within the Shire of Gingin Local Planning Scheme No.9 District Zoning Scheme (TPS 9). The proposed CF development is on land zoned 'General Rural'. The Gingin Shire Council unanimously granted Development Approval for the project at its 17 December 2013 meeting. TPS 9 sets out the objectives of the General Rural Zone as being to:

- Manage land use changes so that specific local character of the zone is maintained or enhanced.
- Encourage and protect broad acre agricultural activities such as grazing and more intensive agricultural activities such as primary sues, with other rural pursuits and rural industries as secondary uses in circumstances where they demonstrate compatibility with the primary use.
- Maintain and enhance the environment qualities of the landscape, vegetation, soils and water bodies, to protect sensitive areas especially the natural valley and watercourse system from damage.
- 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.

In considering the Development application, the Shire Council made reference to the CF being highly suitable for the proposed location and an ideal fit with the existing operations on the site. Council also acknowledged that the CF could provide a sustainable solution to some local community needs, in particular the handling of vegetation trash, chicken litter and Shire green waste. 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 Act.

It is noted that Planning Approval granted for the premises differs from the Works Approval Application. The Planning Approval only allows a total capacity of 50,000tpa for Category 61 operations and 80,000tpa for Category 67A operations. The Application also differs in the following matters:

a) Input of green waste is higher in the works approval application;
b) Input volumes of liquid waste are double that in the works approval application;
c) Specification of hard standing inconsistent; and
d) Planning includes pre-treatment of liquid waste but no pre-treatment is proposed at the CF.

DER's *Land Use Planning Guidance Statement: Land Use Planning Part V, Environmental Protection Act 1986 (October, 2015*) point 4 (c) states that with regard to DER's regulatory functions under Division 3, Part V of the EP Act and its subsidiary legislation, that DER will make DER's formal determination after the relevant planning decisions have been made. Accordingly DER will propose to place restrictions on the proponent under the licence for operations at the CF to ensure consistency with the planning approval.

The Environmental Protection Authority Guidance for the Assessment of Environmental Factors Separation Distances between Industrial and Sensitive Land Uses No. 3 June 2005 document identifies that separation distances for CF (outdoor uncovered regularly turned windrow) for noise, dust and odour emissions 1000m for manures, mixed food/putrescible and vegetative food waste, 500m for biosolids and 150m for green waste while separation distances for industrial liquid waste buffer is case by case.

Potential sensitive receptors in the vicinity of the CF premises are:

- Groundwater: An investigation of the potential shallow ephemeral perched water tables in the locality was conducted in September 2014 and is provided as Appendix 2 in the works approval application. The investigation involved drilling four boreholes (WP1-4) to a depth of 15 m at locations around the proposed CF. The site investigation inspection indicated that no natural wetlands were present in the area.

  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 soaks appear to dry out in the summer and reflect some ephemeral groundwater perching at these sites. Only one drill site (WP1) intersected groundwater at 15 metres below ground level (mbgl); the other three

being dry. The groundwater observed in WP1 may represent a localised perched water table, associated with the water table observed in the nearby excavated soaks to the north and the northwest. The investigation concluded that the soil profile in the vicinity of the CF appear to be dry to a depth of at least 13 m.

The results from WP1, WP2 and WP3, combined with observations of the dry sand quarry to the northwest of the site, and a lack of any natural wetland areas in the vicinity of the site confirm that the perched water table is local, limited in area, and not associated with supporting any environmental features. Consequently, adverse environmental effects are unlikely to result if leachates from the proposed CF infiltrate below the ground surface within the site. The thick layer of clayey sands and sandy clays in the lower portions of the investigation bores indicate the presence of a significant barrier to leakage of any contaminants to the deep aquifer. The bore holes from the five deeper holes (associated with the piggery) indicate an aquitard in the order of 40m thick so it is unlikely this will enable direct transmission of any leachates. Groundwater results indicate depth to groundwater is at least 93mbgl.

- Surface water: There are no watercourses or natural wetlands on or adjacent to the site. There is no flooding risk at the site.

- Existing residences and landowners: The closest receptors are two rural-residential dwelling located on Wannamal Road West at distances of 3.7 km and 7.0 km west of the site. A mining operation is located approximately 8.7 km west on Wannamal West Road near Brand Highway. The nearest urban land is located 20 km to the south at the town of Gingin.

- Bushland: The predominant surrounding land use is a State Forest or uncleared native virgin bush (north, east and south) and a Shire of Gingin gravel pit on rural land to the west.

Construction works
The CF comprises the following facilities:
- Composting pad;
- Non-composting pad;
- Surge green waste area;
- Water balance ponds. Five ponds are required for the CF; one existing pond and four new ponds need to be constructed;
- Access track; and
- Site facilities and ancillary infrastructure.

Further details of the proposed construction and operation of the CF are provided in Appendix 1.

Potential emissions
Potential emissions as a result of the construction and operation of the CF are:
- Potentially contaminated stormwater: potential emissions may arise from the construction and operation of the CF;
- Potential for leachate leakage: potential emissions may arise from operation of the CF;
- Fugitive emission – dust: potential emissions may arise from the operation of the CF;
- Odour: potential emissions may arise from the operation of the CF; and
- Noise: potential emissions may arise from the construction and operation of the CF.

Further details of emissions and regulatory controls for the CF are detailed within section 4 of the Decision Table.

Occupation and planning approval
The Premises is currently occupied by the Applicant.

Consultation
DER referred the Application to the following:

- Shire of Gingin on 02/04/2014.

No response was received, however, the Shire of Gingin did grant a planning approval for the site on 17 December 2013. There is no expiry date on the approval.

Approval of operation
This Decision Document and the works approval specifies the assessment of the Application and regulatory requirements for the CF construction to proceed.

Approval for the operational aspect of the CF will be dealt with and assessed by DER under a subsequent licence/licence amendment application. Please note as part of the licence application assessment, DER will undertake an internal due diligence of the applicant's fitness and competency based on DER's compliance records.

4 Decision table

All applications are assessed in line with the *Environmental Protection Act1986*, the *Environmental Protection Regulations 1987*and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions	W1.2.1 - W1.2.3	**Construction** Condition 1.2.1 included within the Works Approval requires the construction of the works to be undertaken in accordance with the relevant parts of the application supporting documentation subject to the conditions of the works approval. Condition 1.2.2 and 1.2.3 included within the Works Approval states the design and construction specifications for the works (where details of the proposed design and construction are not included in the application supporting documentation). Condition 1.2.3 allows for minor deviation from the design and construction specifications where appropriate. Condition 1.2.4 has been included to require the appropriate construction quality assurance is completed.	Application supporting documentation *Environmental Protection Act 1986* *Environmental Protection (Unauthorised Discharges) 2004*
	N/A	<u>Emission Description</u> *Emission:* Stormwater contaminated with sediment from construction works of the hardstand pads and water balance dams. *Impact:* Contamination of surrounding land and surface water drainage systems. Potential impacts on ecology of surface water from the addition of sediment. *Controls:* Stormwater is directed to swales and sediment traps located around the perimeter of the CF for direct infiltration. <u>Risk Assessment</u>	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions continued	N/A	*Consequence*: Minor *Likelihood:* Possible *Risk Rating:* Moderate <u>Regulatory Controls</u> In accordance with DER's licensing process, no specified conditions for stormwater emissions have been included in the works approval. Contaminated stormwater emissions can be sufficiently regulated under section 49 of the *Environmental Protection Act 1986* (the Act). <u>Residual Risk</u> *Consequence*: Minor *Likelihood:* Possible *Risk Rating:* Moderate **Operation** <u>Emission Description</u> *Emission: S*tormwater contaminated with sediment or leachate from composting operations. *Impact:* Contamination of surrounding land and surface water drainage systems. Potential impacts on ecology of surface water from the addition of sediment. *Controls:* The Composting hardstand area and ponds are lined and uncontaminated stormwater runoff on the premises is directed away from the composting pad. Contaminated stormwater and leachate is directed to a dedicated leachate pond that forms a two staged water-holding dam to receive water that runs off the composting hardstand and allows for filtration of sediment, and to provide a water reservoir for the compost process. Runoff from non-composting hardstand and green waste surge pad will be directed to	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions continued		swale drains. Swale drains will include sediment traps to restrict the movement of water from causing erosion or allowing silting of waterways. Water collected in swale drains will be allowed to locally infiltrate into the sandy soil, and/or be temporarily retained before discharge. Liquid waste will not be applied to any materials outside of the composting hardstand. Risk Assessment *Consequence*: Minor *Likelihood:* Possible *Risk Rating:* Moderate Regulatory Controls In accordance with DER's licensing process and assessed risk profile, no specified conditions for stormwater emissions are proposed to be included in the licence. Licence conditions will be imposed requiring the maintenance of integrity of hardstand infrastructure to reduce the risk of leachate discharges. Contaminated stormwater discharges can be sufficiently regulated under the provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004* and section 49 of the Act. Residual Risk *Consequence*: Minor *Likelihood:* Possible *Risk Rating:* Moderate ***Leachate Management*** **Construction** There will be no leachate generation during construction of the CF. **Operation** Leachate discharges can take place when ponds overflow and/or failure of storage and	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
General conditions continued		processing infrastructure. Refer to Appendix 2 for the detailed risk assessment	
Premises operation	Licence conditions proposed	**Operation** It is recommended that the following additional conditions be drafted onto the licence post construction of the CF, but not limited to: • Stipulating the waste types and quantities that can be accepted at the Premises. The waste types and quantities will be assessed by DER during the licence application, with regulatory controls imposed. This assessment will need to consider compatibility of the waste. • Regulatory controls will also be placed on the processing requirements; DER's Air Quality functional area has identified concern with the potential direct application of liquid waste to windrows (discussed in Odour section). • A condition will be included within the new/amended licence requiring that compost windrows are regularly turned to maintain aerobic conditions and appropriate moisture levels in the composting process. • Size requirements for the compost windrows to facilitate management activities in case of fire. • The storage of green waste and other inputs, the process of composting and pasteurisation and the storage of final compost product must be on the composting hardstand and non-composting hardstand and identified on a map. • A freeboard of 500 mm must be maintained on the composting hardstand leachate dam and each of the five water balance ponds to avoid overflow during large rainfall events. • Infrastructure containment requirements for the composting and non-composting hardstand, leachate collection system, leachate dam and five water balance ponds which will reflect the design and construction specifications included within the Works Approval.	Application supporting documentation Australian Standard AS4454-2012 *Composts, soil conditioners and mulches*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Premises operation continued		• The chemical and pathogen requirements, as per the Australian Standard AS4454-2012 *Composts, soil conditioners and mulches* (AS4452-2012) for final compost quality prior to sale or distribution to the public for unrestricted use. • Limits of contaminant levels in the final products (to require consistency with AS4454) to manage off-site environmental protection	
Fugitive emissions	N/A	**Dust** **Construction** <u>Emission description:</u> *Emission:* Dust arising from vehicle movements (loaders, excavators, bobcats and water cart etc.) during the construction of the CF. *Impact:* Reduced local air quality from airborne particulates is possible. The closest receptors are two rural-residential dwellings located on Wannamal Road West at distances of 3.7 km and 7.0 km west of the site. *Controls:* The use of a water cart if required. The premises complies with the Environmental Protection Authority's (EPA) recommended separation distance of 1,000m for an outdoor uncovered composting facility as detailed in Guidance Statement 3: *Separation Distances between Industrial and Sensitive Land Uses* (June 2005) (EPA GS3). <u>Risk assessment:</u> *Consequence:* Insignificant *Likelihood:* Possible *Risk Rating:* Low	Application supporting documentation *Environmental Protection Act 1986*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Fugitive emissions continued	N/A	Regulatory controls: In accordance with DER's licensing process, no specified conditions for fugitive dust emissions have been included on this works approval. Dust emissions can be sufficiently regulated under section 49 of the Act. Residual risk: *Consequence:* Insignificant *Likelihood:* Possible *Risk Rating:* Low **Operation** Emission description: *Emission:* Dust arising from vehicle movements (trucks, loaders, excavators, bobcats and water cart etc.) during the operation of the CF. *Impact:* Reduced local air quality from airborne particulates is possible. The closest receptors are two rural-residential dwelling located on Wannamal Road West at distances of 3.7 km and 7.0 km west of the site which will mitigate dust generated. *Controls:* The use of a water cart if required. Composting windrows will also be kept in a moist state for facilitate bacterial activity, reducing any particulate lift-off. The premises complies with the separation distance detailed in EPA GS3. Risk assessment: *Consequence:* Insignificant *Likelihood:* Possible *Risk Rating:* Low Regulatory controls: In accordance with DER's licensing process, no specified conditions for fugitive dust	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Fugitive emissions continued		emissions have been proposed to be drafted onto the licence. Dust emissions can be sufficiently regulated under section 49 of the Act. Residual risk: *Consequence:* Insignificant *Likelihood:* Possible *Risk Rating:* Low	
Odour	N/A	**Construction** *Emission:* Odour arising from construction of the CF composting hardstand (bitumen). *Impact:* Unreasonable odour that may interfere with the health, welfare, convenience, comfort or amenity of any person who is not on the premises. The duration of this odour will be limited to the period the hardstand. The separation distance to sensitive receptors will make it unlikely that associated odours will cause an impact. *Controls:* The closest receptors are two rural-residential dwelling located on Wannamal Road West at distances of 3.7 km and 7.0 km west of the site. The site is surrounded by pine plantation. No controls have been proposed. Risk Assessment *Consequence*: Insignificant *Likelihood:* Unlikely *Risk Rating:* Low Regulatory Controls The separation distance is considered sufficient to mitigate odour emissions. In accordance with DER's licensing process, no specified conditions for Odour emissions have been included on the works approval. Odour emissions can be sufficiently regulated under section 49 of the Act. Residual Risk	Application supporting documentation *Environmental Protection Act 1986*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Odour continued	L - Licence conditions may be included	*Consequence:* Insignificant *Likelihood:* Unlikely *Risk Rating:* Low **Operation** *Emission:* Odour (volatilisation of nitrogen in the form of ammonia) arising from operation of the CF, particularly composting operations and the direct application of liquid waste onto windrows. The existing piggery is already a potential source of odour and this operation could potentially increase cumulative emissions. Westpork has submitted a licence amendment application for the piggery for the construction of an anaerobic digester which will potentially reduce odours from the piggery. *Impact:* Unreasonable odour that may interfere with the health, welfare, convenience, comfort or amenity of any person who is not on the premises. The closest receptors are two rural-residential dwelling located on Wannamal Road West at distances of 3.7 km and 7.0 km west of the site. The existing piggery has not been subject to any complaints to DER. *Controls:* Composting will be via the aerobic process which compared to the anaerobic process produces less odour. Odorous solid waste is mixed in such a C:N ratio (4:1) that minimises odour generation. Compost materials are handled such that no waste will be stockpiles or stored such that could create offensive odour. All identified solid waste odours material (for example malting sludge) will be mixed immediately with green waste in active compost rows. Odorous liquid waste will be preferentially discharged into prepared compost rows. Wastewater from the neighbouring piggery is not proposed to be utilised in the composting process. Composting windrows will be aerated to avoid generation of anaerobic conditions that would result in increased odour. Liquid wastes will only be added to active composting windrows. Water balance ponds will mostly comprise stormwater and treated	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Odour continued		wastewater. Risk Assessment *Consequence*: Unable to determine – will assess as part of licence application *Likelihood:* Unable to determine – will assess as part of licence application *Risk Rating:* Unable to determine – will assess as part of licence application Regulatory Controls The premise complies with the separation distance in EPA GS3; however, this does not consider the cumulative odours generated by the existing priggery. Current separation distance of 3.5 km. While the proposed controls indicate that the proposed operation will meet the requirements of GS3, advice from DER's Air Quality (AQ) functional area indicates that EPA GS3 is not intended for assessing cumulative impacts. Advice from AQ also does not recommend the direct application of odorous liquid waste to windrows (rather liquid waste should be directed to balancing ponds and be applied in a controlled manner) to prevent automatic and uncontrolled volumes of liquid waste discharge into opened windrows with limited spaces and pores for air to flow through and the risk of developing anaerobic conditions and spillages, as these would result in increased odour emissions. While some uncertainties relating to the risk of operational odour emissions can be addressed through licence regulatory controls including, specifying the waste types and processes in the licence; the risk assessment will need to be reviewed during the licence application. The licence application will need to demonstrate that the proposed operation will not cause a risk of unacceptable odour emission, alternatively, a licence may not be granted. Residual Risk	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Odour continued		*Consequence:* Unable to determine – will assess as part of licence application *Likelihood:* Unable to determine – will assess as part of licence application *Risk Rating:* Unable to determine – will assess as part of licence application	
Noise	N/A	**Construction** <u>Emission description:</u> *Emission:* Noise arising from the construction of the CF and associated vehicles (loaders, excavators, bobcats and water cart etc.). *Impact:* Interference with the health, welfare, convenience, comfort or amenity of sensitive residential receptors, the closest temporary accommodation is located directly adjacent the Works. *Controls:* The closest receptors are two rural-residential dwelling located on Wannamal Road West at distances of 3.7 km and 7.0 km west of the site. The premise complies with EPA GS3. No noise mitigation strategies have been included in the application to manage noise during construction. <u>Risk assessment:</u> *Consequence:* Insignificant *Likelihood:* Possible *Risk Rating:* Low <u>Regulatory controls:</u> It is considered that the provisions of *Environmental Protection (Noise) Regulations 1997* (EP Noise Regulations) will be sufficient to regulate noise emissions during construction. <u>Residual risk:</u> *Consequence:* Insignificant *Likelihood:* Possible	Application supporting documentation *Environmental Protection (Noise) Regulations 1997*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Noise continued	N/A	*Risk Rating:* Low **Operation** Emission description: *Emission:* Noise arising from the operation of the CF and associated vehicles (grinders, screen, loaders, excavators, bobcats and water cart etc.). *Impact:* Interference with the health, welfare, convenience, comfort or amenity of sensitive residential receptors, the closest temporary accommodation is located directly adjacent the Works. *Controls:* Modelling indicates the expected cumulative noise impact will not exceed the assigned level of 45 dB during operational hours (0700 to 1900 hours Monday to Saturday) at 1,000 m (buffer distance) from the site. The closest receptors are two rural-residential dwelling located on Wannamal Road West at distances of 3.7 km and 7.0 km west of the site. Risk assessment: *Consequence:* Insignificant *Likelihood:* Possible *Risk Rating:* Low Regulatory controls: It is considered that the provisions of EP Noise Regulations will be sufficient to regulate noise emissions during operation. The current licence does not have any conditions regulating noise and none are recommended with the addition of the CF at the premises. Residual risk: *Consequence:* Insignificant *Likelihood:* Possible	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Noise continued		*Risk Rating:* Low	
Monitoring general	L - Licence conditions may be included	Monitoring general conditions have been added to the licence as monitoring of inputs and outputs and process monitoring is required.	Application supporting documentation
Monitoring of inputs and outputs	L - Licence conditions may be included	Conditions recommended to be drafted onto licence to monitor feedstock inputs and compost product outputs. This requirement will allow DER to regulate the volume of waste in compliance with the licence condition specifying waste acceptance and the approved production capacity.	Application supporting documentation
Process monitoring	L - Licence conditions may be included	**Operation** Emission Description *Emission:* Distribution of compost product for unrestricted use in the environment which contain pathogens and contaminants (including heavy metals and pesticides) in excess of AS4454. *Impact:* Local contamination of soils, surface water and groundwater from the use of compost which may have unacceptable levels of heavy metals and pathogens. Could result in secondary human health impacts on a regional scale where compost is used in the production of foods. *Controls:* Compost windrows will be tested for pathogen and contaminant levels. The temperature of the composting windrows will be monitored continuously. The windrows will be required to reach an internal temperature of 55 degrees Celsius for a minimum of 15 days, for the destruction of pathogens, before being combined to form conditioning piles. The conditioning piles will be tested to determine the pathogen and contaminant levels within the compost, prior to being stockpiled for sale. Westpork propose to follow the requirements of Australian Standard AS 4454 *Composts, soil conditioners and mulches*	Application supporting documentation Australian Standard AS4454-2012 *Composts, soil conditioners and mulches*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Process monitoring continued		(AS4454). If the appropriate classification level is not achieved, the compost may be returned to a composting windrow for further treatment. Risk Assessment *Consequence*: Moderate *Likelihood:* Possible *Risk Rating:* Moderate Regulatory Controls The Application provides Controlled Waste Categories (inserted in Appendix 1, Table 3) to be accepted at the premises for re-cycling through the composting process. It is recommended the suitability of these be assessed as part of the licence application determination, and appropriate regulatory controls be placed on the licence. DER has not assessed the compatibility of storing the different liquid waste types together, or the acceptability of the different waste streams due to the presence contaminants and metals (e.g. industrial wash water high in metals or hydrocarbons). Acceptance criteria will be required in the licence. A condition will be included within the Licence specifying the chemical (heavy metals and pesticides) and pathogen requirements (as per AS4454) will need to be satisfied for final compost quality prior to sale or distribution. It is considered that this requirement will reduce the risk to public health and the environment where the final use of the product is uncontrolled. It is also recommended that during operation of the CF, monitoring of the feedstock, compost windrows and compost product is proposed. The monitoring will include sampling to determine pathogen and contaminant levels and the monitoring of other parameters such as temperature and moisture content. For example, a licence condition will specify that the core temperature of the composting windrows must be maintained above 55 degrees Celsius for a period of at least 15 days.	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Process monitoring continued		Residual Risk *Consequence*: Moderate *Likelihood:* Unlikely *Risk Rating:* Moderate	
Information	W2.1.1 – W2.1.3 L - Licence conditions may be included	**Construction** Condition 2.1.1 included in the Works Approval requires the submission of detailed construction plans and drawings prior to construction. The submission will verify that the infrastructure to be constructed meets the specifications of the Application and the Works Approval conditions by way of qualified professional certification. The condition includes the provision for minor deviation from design and construction specifications under Condition 1.2.3. Plans and drawings were lacking in the Application. Conditions 2.1.2 – 2.1.3 included within the works approval require that the construction specifications for infrastructure are confirmed as compliant in writing by the Works Approval Holder following the completion of construction. The conditions include the provision for minor deviation from design and construction specifications under Condition 1.2.2. **Operation** Recommend amendment to include all new monitoring information for the CF be included in the premises Annual Environmental Report information.	Application supporting documentation
Works Approval Duration	N/A	The works approval will be issued for three years. The construction of the facility is considered to be low environmental risk. The Shire of Gingin has not placed any restrictions on this proposal.	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Licence Duration		The duration of the licence will be determined when the application is received.	

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
7/4/2014	Application advertised in West Australian (or other relevant newspaper)	No comments received	N/A
23/3/2016	Proponent sent a copy of draft instrument	The proponent provided minor comments to DER on 30 March 2016 as summarised below: <u>Works Approval:</u> • Table 1.2.2 Section 1.a.ii – Should state 'minimum' as opposed to 'maximum' with regards to the required 42mm bitumen seal. <u>Decision document:</u> • Property size is 421 ha. Please update. • Carcass disposal – as managed under the current licence for the piggery (L5724/1993/11) dead pigs are currently buried on-site in disposal pits. If there is an issue with the composting operation we would like to have this as an option rather than be restricted to simply sending the dead pigs offsite to a licensed landfill site.	All comments were considered/verified and the package was amended accordingly.

6 Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 2: Emissions Risk Matrix

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

Appendix 1

The site will comprise a hardstand area that will be used for composting and non-composting activities, water balancing (pond) system and a surge green waste area. An overview of the operation is detailed below.

Composting proposal

Composting is the process of combining carbon and nitrogen sources at optimal moisture and oxygen condition to permit thermophilic microorganisms to break down those sources into compost beneficial for plant health. The carbon and nitrogen sources are obtained through various controlled and non-controlled wastes, mixed and formed into windrows, which are regularly wetted and aerated for a period of three to six months. Compost product is matured and screened to meet compliance and customer preference. Wastes accepted for compositing at the CF will be 100% recycled.

The composting process will be applied to solid and liquid wastes through the technology of open-windrow aeration composting. As the composting process is exothermic and windrows can reach temperatures of around 60ºC, which is ideal for the microorganisms to prosper, water is evaporated and needs to be reapplied frequently. The windrows are regularly opened approximately every seven days, moisture added, and the rows turned using mechanical means.

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. This beneficial use precisely fits current Federal and State government policy objectives in relation to waste management, pollution prevention and soil conservation.

The CF have applied to take up to 90,000 tonnes per annual period (tpa) of solid waste (green waste, nitrogenous waste and benign waste) and up to 100,000 tpa of liquid waste (grease trap, pond water, stormwater, and some wash down from industry processes). Solid waste inputs are based on conservative estimates from previous experience and the types and volumes of waste that are available to be processed. The water balance investigation has been undertaken based on an input of green waste of 60,000 tpa rather than the total solid waste. This is a conservative approach as, while composting of the green waste would use the majority of the input water during composting, other wastes such as nitrogenous wastes would also use some water during the process. The amount of liquid waste that would be able to be used by the compost facility has been calculated at approximately 100 000tpa (based on the site and process specific water balance).

Liquid waste will be directly applied to windrows wherever possible; however, some liquid waste will be stored onsite to match waste water receivals with the water demands of the composting process (i.e. to buffer variations in the inflow of liquid waste to prevent compost from drying out or being over saturated).

Pasteurising Green waste

Manufactured mulch is shredded green waste pasteurised in accordance with the processes set out in Australian Standards AS4454-2003 (AS4454) Clause 2.3.1 to become a safe product suitable for top-dressing landscapes. Mulch shredded to a consistent particle size is formed into a stockpile and water added to permit thermophilic microorganisms to act for a period of several days (defined in AS4454). This is sufficient time to kill weed seeds, fungi, pathogens and other plant diseases and to make the mulch into a usable ingredient in composting and a safe product.

Green waste will be treated using the pasteurisation method on site on the southern portion of the pad to make mulch to be used in the compost process, and as a saleable product.

Liquid Waste Treatment
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. Liquid waste that is suitable for composting is directly applied to the composting windrows, whenever possible. If there is a temporary excess of liquid waste from time to time, it will be stored in the balancing pond system until it can be used. More odorous liquid wastes will be given preference for placement into the compost process than less odorous wastes.

The water balance pond system will be used to manage the onsite water stream, store liquid waste and ensure the appropriate amount of water is available to be applied to the composting windrows, as required. These ponds include a leachate pond adjacent to the compost pad (to be constructed), a primary water balancing pond (existing on site) and three supplementary water balancing ponds (to be constructed) with a total volume of approximately 63 000 m^3.

Liquid waste will only be applied to the composting process within the lined compost pad hardstand area (northern 3.6h a part of the hardstand).

Soil blending
Soil blending as defined under Category 67A of the proposed licence will be used only for final blending of the compost to make the finished compost product.

Inputs
Inputs/ingredients are received in bulk form from commercial processes. Compost ingredients (solid and liquid wastes) are added to new and active compost rows as the ingredients arrive at the facility. All solid waste ingredients (other than green waste) to be composted are proposed to be handled in a *just-in-time* manner to avoid storing of ingredients on areas other than the compost area, where possible. All liquid waste ingredients are proposed to be added to the compost rows as they arrive on site; however, some liquid waste is required to be stored onsite to coincide with the water demands of the composting process (i.e. to buffer variations in the inflow of liquid waste to prevent compost from drying out). More odorous liquid waste will be given preference onto compost rows than less odorous wastes.

Ingredients are received, incorporated and composted in a specific manner. Nitrogenous solid ingredients are blended with green waste in a carbon-heavy ratio of 1:4. For example, manure received from the adjacent piggery is mixed with green waste at a ratio of 1 bucket load to 4 bucket loads of green waste. This occurs in a just-in-time manner whereby ample shredded green waste is available to be blended as and when deliveries of nitrogenous solid waste arrive. Not only does this eliminate the need for stockpiling odorous waste, it reduces the ingredient handling time.

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. Self-heating commences within a matter of hours of mixing, and composting begins.

As composting is a process that both requires high moisture inputs and causes large volumes of moisture to evaporate, the on-going process for windrows is to apply moisture and aerate. 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%. Liquid waste ingredients are applied directly from tankers into composting windrows by the gravity discharge into channels formed in the windrow.

Details of proposed solid waste inputs are as follows:
1. Shredded green waste (primary source of carbon) will be the predominant ingredient. The expected amount is approximately up to 60 000 tpa.

2. Nitrogenous solid wastes; this includes wastes that is compostable such as foodstuffs, vegetable matter, manure, malting sludge, other food wastes, spoiled fertilisers, etc. Annual volumes for each individual type will vary; however, the expected total volume is approximately up to 20,000 tpa. Pig manures from other facilities are not permitted to come onto the property 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.
3. Benign solid waste. Non-biodegradable wastes, which are beneficial for the 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. The expected volume is approximately up to 10,000 tpa.
4. 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.

Details of proposed liquid waste inputs are as follows:

1. Nitrogenous liquid wastes. Bulk liquids comprised of 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, stormwater and some wash down water from industry processes (i.e. from the cleaning of trucks and earthmoving equipment). The volume to be managed without any liquid discharges to the environment from the process is approximately 100,000 tpa. Excess wastewater suitable for compost will be diverted and temporarily stored within the water balancing pond system for recycling. More odorous liquid waste will be given preference for introduction into compost process than less odorous wastes.
2. Other liquid wastes beneficial for plant health, such as phosphoric acid and wool scouring wastes. Only small volumes are expected and have been included in the estimation in point 1 of this list.

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 or the need to take advantage of availability green waste as and when it becomes available may create throughput spikes throughout the year. The types and volumes of solid wastes available for composting have been estimated from previous experience and in discussion with the local government authority and other waste generators. Liquid waste input volumes have been calculated using a site water balance discussed below.

The controls that will be in place at the CF to ensure appropriate amounts of liquid waste are not applied to the compost are outlined below and acceptance method in the Liquid Waste Acceptance Management Plan (submitted as Appendix 3 in the works approval application):

1. The compost rows will be monitored daily at regular (spatial) intervals for moisture content.
2. If the moisture content is below or approaching 30% (the ideal range of moisture content is between 30% and 60% moisture), liquid waste will be applied to ensure the moisture remains in the ideal range.
3. For each full-length windrow, liquid waste is applied at regular intervals at a rate of approximately 10% w/w every seven days.
4. Ideally, the liquid waste would be accepted on site and be applied directly as needed; however, some buffering is required to manage short term excess in liquid waste that cannot be placed on the compost rows immediately.
5. If the moisture range is acceptable but it is envisaged that liquid waste would be needed within the seven day period, and provided there is freeboard in the water balancing pond (>300 mm), liquid waste will be accepted and stored temporarily.
6. If the compost moisture range is acceptable and there is no freeboard in the ponds (<300 mm), liquid waste is not accepted on site until these become available.

Table 3 lists the Controlled Waste Categories in Schedule 1 of the *Environmental Protection (Controlled Waste) Regulation 2004* that are proposed to be accepted through the proposed CF.

The volumes of each of the waste streams will be a variable factor dependent on variations in the WA market. The liquid waste volumes that will be accepted will be up to 100 000 tpa and can be made up of any combination of the proposed liquid wastes. Liquid wastes are greater than 95% water, most of which is evaporated during the composting process. Some of the liquid stored within the water balancing ponds for composting will also be lost to evaporation.

A broad description of acceptable wastes is 'biodegradable wastes which after digesting in a predominantly green waste compost process, result in a soil-product which meets client requirements'. 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 3 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.

Westpork is proposing to compost pig carcasses from the adjacent piggery which will be taken into the waste input stream of the compost facility. It is proposed that management of carcasses will be undertaken as follows:

1. A bed of active (hot) compost laid in a dedicated area of the facility (north-west corner) to a depth of 0.5 to 1 m, suitable for the placement of carcasses will be prepared.
2. Carcasses will be carted to the CF by Westpork and placed onto the prepared compost bed.
3. As soon as practical after placement, active compost will be placed over the carcasses to a minimum thickness of 1 m.
4. Carcasses will be progressively placed and covered to form a lengthening "carcass compost row" and left static for a period of approximately three months.
5. When appropriate, the static carcass compost row will be opened to determine the extent of biodegradation of the carcasses. Once sufficiently digested, the carcass compost row will be aerated and added to regular active compost rows for integration into the primary compost process.

The behaviour of a carcass in a bed of active compost is not precisely known. The procedure outlined above will be amended as necessary to satisfactorily recycle carcasses in the CF. In the event that carcasses cannot be adequately processed to meet Australian Standards they will be disposed of on-site in accordance with current licence conditions in L5724/1993/11 (namely conditions S1(a) and S1(b)), or to an off-site licenced landfill.

Outputs
The primary output is compost which will be trucked off-site.

Composting pad hardstand
The main CF hardstand area is 6 ha and the composting area is limited to the northern part of the main hardstand (i.e. 3.6 ha). The composting area will comprise a 7mm bitumen emulsion primer seal overlaid by a 35mm thick layer of asphalt to protect the bitumen seal. This gives a minimum 42 mm thick bitumen seal and asphalt which will be constructed over 250 mm thick compacted gravel hardstand, and will accommodate up to 25 windrows. During manufacture, compost is formed into windrows of up to 160 m long.

Windrow profiles will vary to suit compost turners (approximately 6m wide and height up to 2.5m) or loaders (approximately 8m wide x 3.5m high). Clearance between windrows will vary from 2 to 6m (alternating) to accommodate the compost turner and other machinery. Clearance along the boundary of the composting pad will be a 3m wide access path on the west and east sides, a 6m turning zone on the north side and a 6m tanker unloading zone on the south side. Thereafter, concrete bunded kerbs will accommodate and control any leachate destined for the leachate dam.

The CF hardstand area will incorporate the following characteristics:

- Compost windrows are formed and regularly turned until manufacturing is complete.
- Manure and other putrescible waste are mixed with green waste to form compost windrows.
- Liquid waste is applied to compost windrows during the manufacturing process.
- Design is suitable for heavy machinery use.
- Surfaces are graded to ensure surface water is transported to perimeter catchment drains that will flow to the dedicated leachate pond.
- The hardstand pad and all catchment/diversion drains will be lined to meet a permeability of 10^{-9} m/s.
- The perimeter concrete bunded kerb will be 150 mm high by 150 mm wide and will be laid on top of the bitumen to create an impervious seal.
- Retention of leachate will be in the dedicated leachate dam located adjacent to the compost pad. This will be a two staged water-holding dam to receive water that runs off the composting hardstand and allows for filtration of sediment, and to provide a water reservoir for the compost process. The composting hardstand leachate pond will be HDPE lined with a permeability of 1×10^{-9} m/s.

Table 3 Proposed Controlled Waste Categories accepted at the CF

Category Group	Waste Code	Waste Type	Maximum total volume intake	Use in composting process (agronomic rationale)
B Acids	B100	Acid solutions or acids in solid form	1%	This will include phosphoric acid and citric acid and any other acids related to food and fertilizer production. Category B100 contains a variety of acids, many of which do not confer direct benefit to the compost process. There are specific wastes within category B100 that are highly beneficial to both composting and the resultant finished compost. Category B100 wastes sought are comprised of phosphoric acid and citric acid and any other acids related to food and fertilizer production. The composting process goes through an alkaline phase, which takes significant time for the compost to mature and stabilise. The application of beneficial acids expedites the maturation of compost to achieve normal and acceptable pH. Phosphoric acid is also beneficial as it is the base ingredient in phosphoric fertilizers. Phosphorous is the most expensive of nitrogen/phosphorus/potassium (NPK) in mineralised fertiliser form, and the value of compost to a grower is greatly enhanced with increases in phosphorus (however, within the requirements of the Australian Standards). There are some crops and markets that require more acidic soil (e.g. berries). The use of acids that do not dramatically affect NPK are important to modify pH in this regard, for example citric acid.
C Bases	C100	Bases solutions or alkalis in solid or liquid form	1%	Alkalis are extremely useful in modifying pH to suit the requirements of certain markets. For example, some plant species require an alkaline soil to thrive. Many alkalis within category C100 are fertiliser elements that are essential for composting and valuable for plant nutrition at the end of maturation. A few examples are as follows: • Ammonia and derivatives are nitrogen sources - essential activator to green waste for balanced composting • lime is an widely used agricultural ingredient providing slow release calcium and pH balancing of the soil • potash is a fertiliser necessary for WA's potassium starved soils • calcium hydroxide provides the same effect, but in a faster release calcium.
D Inorganic Chemicals	D300	Non Toxic Salts	5%	Non toxic salt includes mineral and fertilizer salts that are the staple for food production (fertilizer). There are certain waste streams that are very valuable to composting in this regard, for example, fertilizer plants wash down. However, there are wastes in this category that confer no benefit to plants and composting bacteria. Therefore, D300 will be limited to non-toxic salts that are sourced from fertiliser and fertiliser related waste (for example, water damaged/burst bags of urea) which contain a predominance of elements recognised to be beneficial to plant and soil health.
K Putrescible and Organic Wastes	K100	Animal effluent and residues	2%	Provides organic matter for composting. Key source is related to the adjacent piggery with other sources providing fowl and other manure opportunities.
	K110	Wastes from grease traps	80%	Grease-trap waste is a well-known moisture and bio-activator source.
	K190	Wool scouring wastes	10%	This is the cleaning residue of greasy wool. Wool scourings are sometime pelletised and directly applied to the land. In the composting process, wool scouring waste will provide detergent (highly beneficial as a wetting agent negating the need to purchase commercial alternative inputs), dirt and water.
	K200	Food and beverage processing wastes	10%	Provides organic matter for composting.

Category Group	Waste Code	Waste Type	Maximum total volume intake	Use in composting process (agronomic rationale)
L Industrial Wash Water	L150	Industrial wash waters contaminated with a controlled waste	10%	This material is dirty water and detergent (i.e. from the cleaning of trucks and earthmoving equipment). The value to composting is the surfactants that these streams contain. Composts are used, in part, to increase water holding capacity of the soil. A large component of compost is carbon. Each unit of carbon can hold four units of water, an important factor for dry WA soils. Organic materials like compost can dry out, and if they do, they become waxy and hydrophobic (i.e. repel water). Non-wetting soils are overcome with surfactants, and surfactant used in composting helps the carbon rich substrate receive and absorb liquid quickly. The benefits are: • reduced turning time to achieve ideal moisture content in the compost rows • reduced liquid waste escapes on the pad • increase the homogenous construct of the composting pile • reduces the composting time. Essentially, provided the wash water is not high in metals or hydrocarbons, this is a valuable material for the process. Testing of these streams will be required prior to acceptance as outlined in the Liquid Waste Acceptance Management Plan (Appendix 3).
M Organic Chemicals	M250	Surfactants and detergents	5%	As explained, 'wettability' is a major factor in composting and soil use.

Note: Westpork acknowledges the total volume intake exceeds 100%. This is to allow for variations within the categories of the amount of controlled waste accepted at the site. The maximum liquid waste intake would not exceed 100 000 tpa.

Non-composting pad hardstand

Non-composting hardstand is limited to the southern part of the main CF hardstand pad (2.3ha) and will be constructed for the purposes of processing of green waste into mulch (approximately 60 000 tpa) for use within the composting process, as well as for storing of finished compost, soil blending, and vehicle access, parking and office area. Westpork is proposing that the non-composting hardstand pad does not require a permeability of 1×10^{-9} m/s. The non-composting hardstand pad will have a sand sub-grade compacted to 95% Maximum Dry Density (MMD) overlain by a gravel sub base of 150mm thick compacted layer compacted to 95% MMD with an additional gravel base-course 100mm thick compacted layer compacted to 95% MMD.

Stormwater runoff from non-composting hardstand will be directed to swale drains. Swale drains will include sediment traps to restrict the movement of water from causing erosion or allowing silting of waterways. Water collected in swale drains will be allowed to locally infiltrate into the sandy soil, and/or be temporarily retained before discharge.

Surge green waste area

For surge volumes of green waste (i.e. large amounts of green waste are received after large storms and often during spring), a supplementary hardstand will be constructed. This area is located adjacent to the three small water balancing pond and is an area that will be used temporarily if there is an excess of green waste. The surge green waste area is located adjacent to the three supplementary ponds and is approximately 1.6 ha. It will be a hardstand area for the purpose of temporarily storing green waste and will not be used for composting or any other processing. Westpork is proposing that the surge green waste hardstand pad does not require a permeability of 1×10^{-9}m/s. The surge green waste area will have a sand sub-grade which will be graded and compacted to 95% MMD with a gravel base-course 150 mm thick layer of compacted gravel compacted to 95% MMD.

Stormwater runoff from the supplementary hardstand will be directed to swale drains. Swale drains will include sediment traps to restrict the movement of water from causing erosion or allowing silting of waterways. Water collected in swale drains will be allowed to locally infiltrate into the sandy soil, and/or be temporarily retained before discharge.

Water balance ponds

To balance the water needs, five water balancing ponds are proposed to be used:

1. The leachate pond located adjacent the composting area has a capacity of 3,300 m^3 which will receive leachate and stormwater runoff via bunds surrounding the composting area. Attenuated water is re-used back into the compost or for dust control.

2. One existing HDPE lined pond of 50,000 m^3 (that will be transferred to the compost facility for sole use) and would be used as the primary water balancing pond.

3. Three smaller ponds (of 3,300 m^3 each) are to be used as supplementary water balance ponds adjacent the large pond for smaller amounts of segregated wastewater (i.e. low-strength acids).

This gives a total capacity for the five water balance ponds of approximately 63,000 m^3.

All new ponds will be constructed with an HDPE liner with a coefficient of permeability of less than 2×10^{-10} m/s (ASTM method D4716), a minimum thickness of 1.00 mm ±5%, minimum tensile strength at yield of 16 000 kN/m2, and 550 kN/m2 at break (ASTM method D638, type IV 2), Pond batters will be at a 30% gradient to prevent liner slippage and all seams and joints will be continuous and overlapped by a minimum of 100 mm prior to joining.

The existing pond is a 1.5 mm HDPE lined pond constructed by Westpork in 2009; this does not have a sediment/detritus trap which can result in sludge generation and reduced pond capacity.

Water balance ponds will mostly comprise stormwater (generated from lined composting hardstand pads) and recycled wastewater.

Westpork is proposing to maintain a 500 mm freeboard in the water balance ponds (section 4.3.1, page 21, point 6) despite references of 300 mm elsewhere in the application.

Loading ramp
The loading ramp will be constructed to provide an elevated platform for machinery to safely load trucks with finished compost and soil products. The loading ramp will have a 1.8 m high tabletop of 6m width and 5m 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. The loading ramp walls will be constructed with 350mm 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. 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 and allow for ease of cleaning.

Washout bay
A washout bay will be constructed to allow vehicles, after discharging their load into the composting rows, to have any residue safely washed out. This will permit vehicles to return to service direct from the facility, prevent cross-contamination and to ensure 'dripping' does not occur from tanks or bins. A 32mm diameter poly pipe will provide water to the washout bay, which will be manually operated with a tap and hose.

The washout bay will be 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. It will have a flat floor overlaid with the same profile as the composting hardstand, which will provide an impermeable surface. The washout bay can easily and regularly be cleaned by using mulch to soak up any water and then deployed into active compost rows on the adjacent hardstand.

The washout bay will share a common (rear) wall with the loading ramp (1.8 m high). The other walls will be constructed with 350mm wide mass limestone blocks or reinforced concrete equivalent. Side walls will be tapered from 1.8m high to 0.6m high.

Figure 2 provides an overview of the proposed CF.

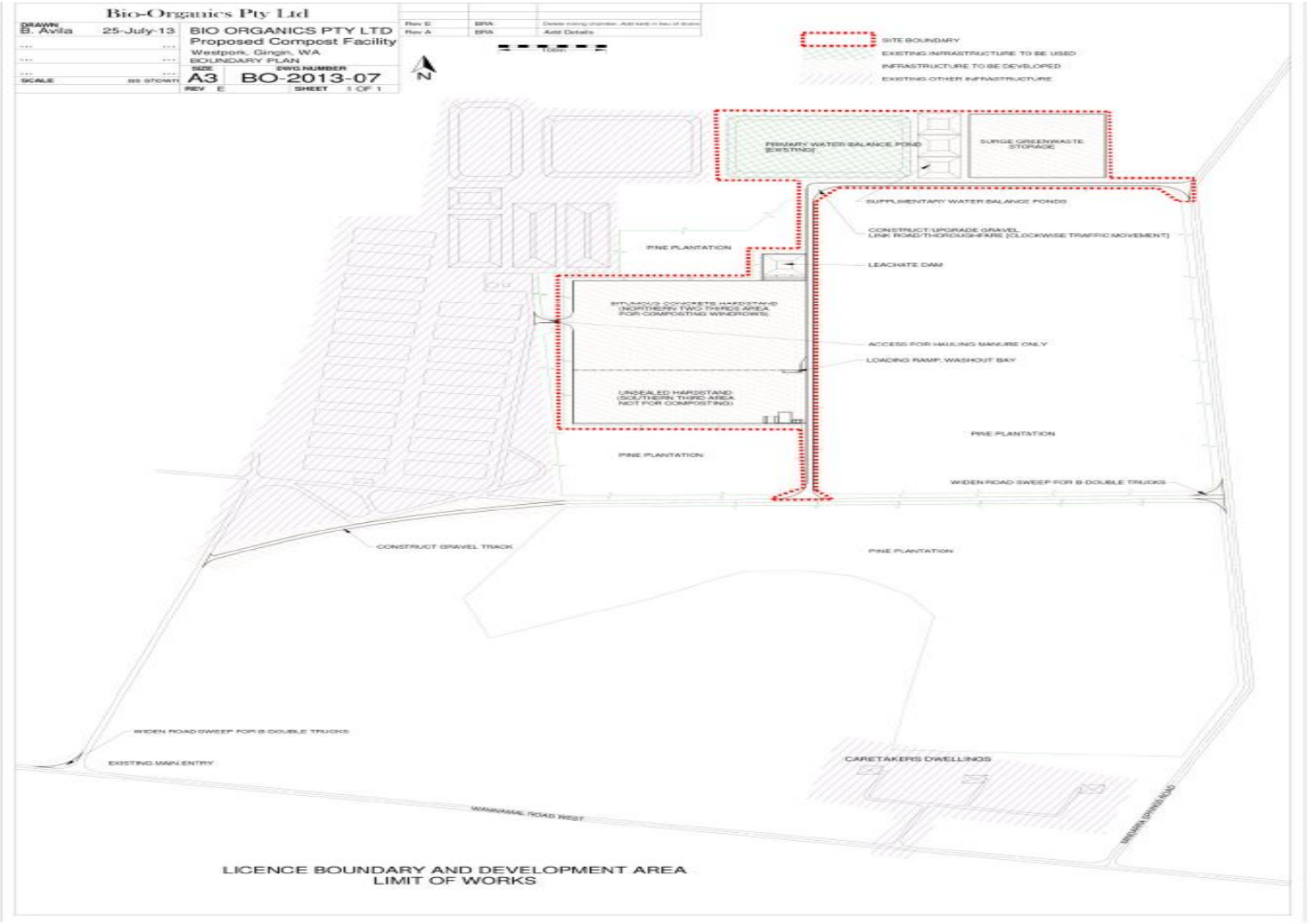


Figure 2 Overview of the proposed CF

Appendix 2

Westpork has submitted a detailed site water balance which is based on the amount of solid waste that is expected to be available for the compost facility, recent previous research specific to the proposed operating conditions, and review of publicly available literature on a range of relevant parameters, as discussed in the following sections. The nominal annual process water balance, based on an input of up to 60 000tpa of solid (green) waste is presented in Figure 3. A key objective of development of the water balance was to define the volume of waste water input that could be processed without requiring direct discharge of any leachate from the composting pad.

The assumptions and calculations used to assess the annual process water balance are outlined in the following sections on inputs and outputs, and the resulting water balance discussion. The volumes of liquid waste calculated have been used to inform the volumes of liquid waste that could be processed at the compost facility.

Inputs

The following represents the basis for estimation of input fluxes in the water balance:

1. Solid waste moisture (green waste): processing of 200,000 m^3 of green waste per year with a bulk density of 0.3 t/m^3 (60 000 tpa) at 30% moisture content (18,000 m^3 of water). 30% moisture content by weight is a conservative assumption based on the highest values presented in Oxana & Haynes (2013).
2. Rainfall on the composting pad is annual rainfall of 740 mm over a pad area of 36,000 m^2 (26,640 m^3 of water).
3. Rainfall on the ponds is annual rainfall of 740 mm over the primary pond area of 34,000 m^2 (25,160 m^3), plus the three supplementary and leachate pond total area of 6,400 m^2, or 1,600 m^2 each, (3,552 m^3, or 888 m^3 each), totalling 29,896 m^3.
4. Wastewater: up to 100,000 m^3 of wastewater input to the plant over a year to enable 40% moisture content in the product compost after accounting for exothermic evaporation in the composting process (see discussion under Output 4 below).

Outputs

The following represents the basis for estimation of output fluxes in the water balance:

1. 70,000 tpa of finished wet compost with a moisture content of up to 40-50% (University of Missouri Columbia 2013). A conservative moisture content of 40% has been assumed for the water balance (28,000 m^3/yr). A significant reduction in the total mass of material being processed (solids plus water) can occur as a result of the composting process generating volatiles and water vapour (2cg 2013). However, the addition of solid wastes such as nitrogenous and other benign waste (not accounted for in the water balance) will largely offset this. The water balance is not sensitive to this issue, and it is consequently not accounted for in the water balance calculations.
2. Evaporation of rainfall from the pad surface is conservatively assumed to be zero, as evaporation rates during wet months are low, and no rainfall is available during the drier high evaporation rate months.
3. Evaporation from the primary water balancing pond is 52,290 m^3 based on pan evaporation rates of 2197mm/yr with a pan conversion factor of 0.7 over a pond area of 34,000 m^2. The same evaporation rates have been applied to the 6,400 m^2 area of the supplementary ponds, assuming a utilisation factor for those ponds of 0.75 (annual evaporation of 7,382m^3). The water balance is relatively insensitive to the evaporation estimates from the supplementary ponds because of their relatively small area. The total annual pond evaporation is 59,670m^3.
4. Potential annual evaporation from the composting process is calculated to be up to 86,866m^3 based on the exothermic oxidation energy available in compost material of 14,000 MJ/t, and resulting evaporation rate of 0.0004 m^3/MJ (derived from examples provided in Forgie et al. 2004, and assuming an exothermic efficiency of 26%.
5. Zero net direct discharge of any liquids.

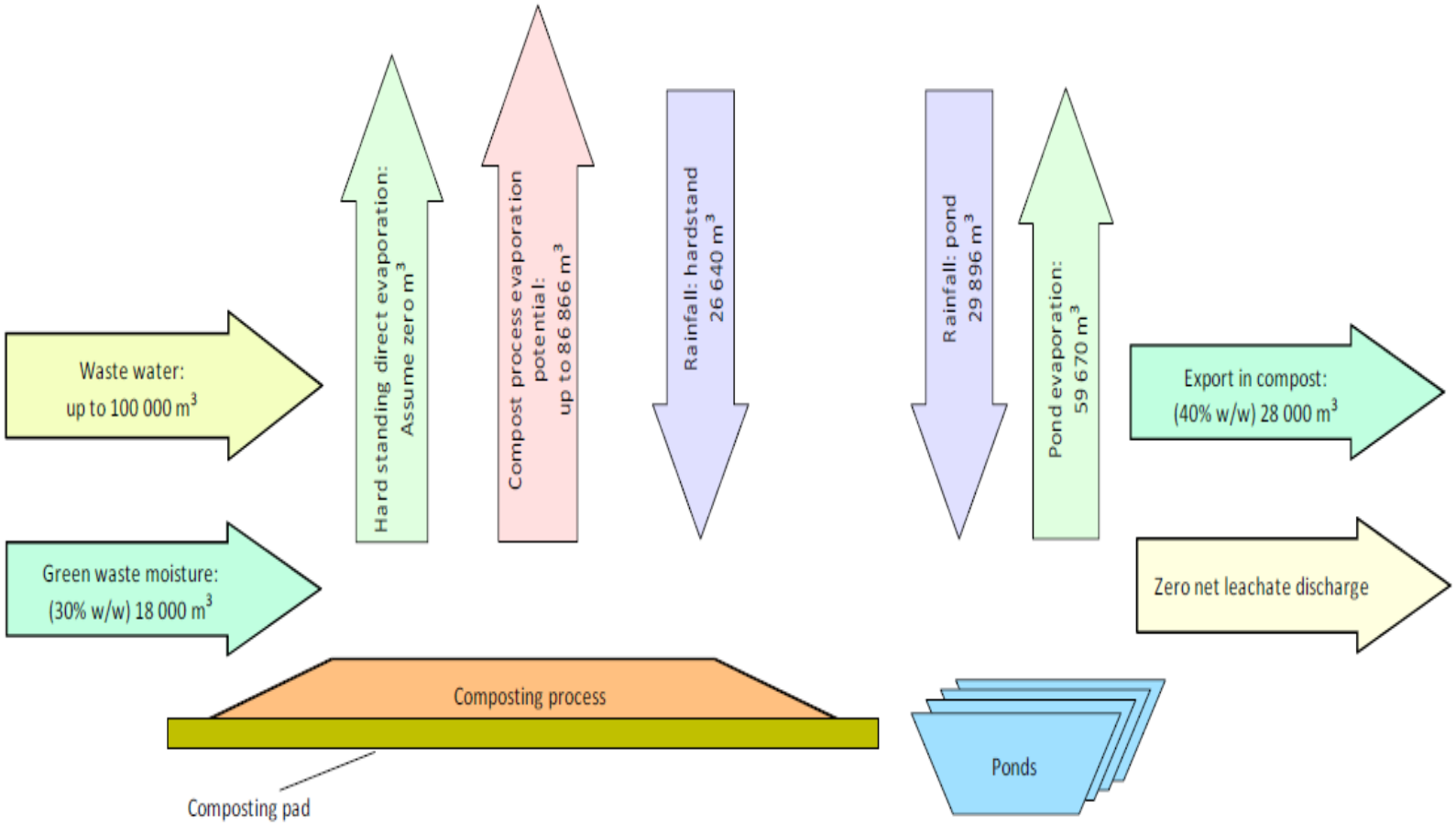


Figure 3 Annual process water balances

Water balance

This water balance implies that the ratio of wastewater to green waste inputs should not exceed a ratio of about 1.7 (w/w) to achieve zero net liquid discharge. The exothermically induced evaporation from the composting process is capable of utilising all wastewater inputs up to this amount (~100,000 m^3 at an exothermic efficiency of 26 %), and dominates the water balance. It is proposed that inputs of wastewater at a ratio somewhat lower than this could be tolerated while still achieving the desired compost moisture content (40-60 %). If the full volume of 100,000 m^3 of water is not provided, the exothermic evaporative loss rates can be reduced within the composting process to some extent, without materially affecting that process. In effect, the exothermic evaporation potential can be used to control and limit discharge of surplus water to the water balancing pond system to ensure no net water discharge other than through evaporation or as finished compost moisture content. In accordance with this, this application is seeking approval for input of up to 100,000 m^3/yr of waste water, and the composting process will be managed to achieve the required exothermic evaporative loss.

The proponent has submitted a water balance spreadsheet is presented in Appendix 6 of the application.

Advice from DER Principal Hydrogeologist includes the following:
The water balance provided in the Works Approval document for the proposed composting facility correctly identifies the principal inputs and outputs of the water balance and indicates that on an annualised basis at least, there should be sufficient storage to manage wastewater at the site.

However, most Australian jurisdictions recommend that water balances for composting facilities are undertaken on a monthly basis and that the cumulative volume of wastewater in storage ponds is tracked over a period of two or more years to ensure that ponds will maintain sufficient freeboard during wet periods (a minimum of 0.5 metres), and that a 1:10 ARI rainfall event will not cause overtopping in ponds when they have been subjected to a prolonged period of above average rainfall (at least 90th percentile rainfall). An example of a water balance that was carried out on a monthly basis for a composting facility that is licensed by the Victorian EPA can be found at the following web site:

http://dsewebapps.dse.vic.gov.au/shared/ats.nsf/(attachmentopen)/B0B167DFBB3373B1CA2579F6007EF7D3/$File/Ramsay+Water+Balance+Report+Jul+2011.pdf?OpenElement

It is recommended that a similar monthly water balance analysis is undertaken for the proposed composting facility in Gingin.

If the proposed solid waste intake is less than the maximum capacity, the maximum liquid waste intake into the CF will be reduced in proportion to reduced throughput i.e. if 50% solid waste accepted in the year, 50% of the nominated liquid waste will be received.

The preference is to use all the liquid waste that comes to site directly into the composting process, which prevents double-handling. However, some buffering capacity will be needed to manage short-term excess in liquid waste that cannot be immediately placed on the compost rows.

Short-term variations in receival rates of waste water to the site will be buffered through use of the pond system (primarily the 50,000 m^3 water balancing pond) when liquid waste inputs temporarily exceed composting demands. The 1:2 ratio of pond volume to annual input volumes should be more than sufficient to provide adequate buffering capacity. The Proponent advised that under no circumstances will wastewater be disposed to other than a water balance pond with sufficient freeboard (>500 mm), or the composting pad itself which is the preference. No wastewater will be discharged onto site other than to either of these two locations. If there is insufficient capacity to

receive liquid waste to either the ponds or composting pad then receipt of the liquid waste will not accepted on site.

Leachate from green waste

Research that has been carried out by the Canadian Department of Fisheries and Oceans and Environment Canada[1] (Samis et al., 1999) has indicated that leachate from fresh wood waste can contain a variety of organic compounds including terpenes and phenols which are toxic to aquatic organisms and which can bio-accumulate in tissue in some organisms. Additionally, anaerobic decomposition of plant material can take place with a period of a few days in large stockpiles (accompanied by large temperature increases), and can produce leachate that has a high biological oxygen demand (BOD) and nutrient concentrations. These factors indicate that, despite the proposed short waste storage time, leachate from poorly managed green waste stockpiles has the potential to cause environmental harm in downstream water bodies if the wastewater storage pond at the site were to overflow.

Operation

Emission description:

Emission: Leachate arising from the composting process during operations at the CF, including the storage of green waste that may enter the environment from overflow of the water balance ponds or leachate pond at the Compost Hardstand pad dam, or failure of pond linings.

Impact: Contamination of surrounding land, groundwater and surface water drainage systems. Potential impacts on ecology of land, groundwater and surface water from the addition of nutrients, metals and heavy metals. The application references ephemeral groundwater perching in the area during wetter months that feeds soaks in the area used for stock watering; these are more than 600 m away. The neighbouring piggery does rely on ground water production bore and monitor the quality for use on the premises. The direction of groundwater flow is not known.

Controls: Depth to groundwater is at least 13 mbgl for ephemeral aquifer and at least 78 mbgl for the confined aquifer. Composting has the potential to produce leachate so the hardstand is lined to a permeability of 1×10^{-9} m/s and stormwater and leachate is directed to an adjacent dedicated leachate dam where leachate is re-cycled through the compositing process and does not overflow into the environment. The water balance ponds are lined to a permeability of 1×10^{-9} m/s and are designed to contain sufficient freeboard of 500 mm to ensure no water overflows into the environment. It is not expected that non-composting and green waste surge area will generate any significant leachate.

Risk assessment:

Consequence: Minor
Likelihood: Possible
Risk Rating: Moderate

Regulatory controls:

It is recommended that licence conditions be drafted to the licence to monitor monthly water balance analysis and manage the water balance pond freeboards as this has been catered for in the design of the ponds and this is discussed in the Premises operation section above. No conditions are recommended for groundwater monitoring in this assessment given the construction requirements and separation distance to groundwater. The green waste storage controls are considered adequate to manage the associated risk.

[1] Samis, S.C., Liu, S.D., Wernick, B.G. and Nassichuk, M.D., 1999. *Mitigation of Fisheries Impacts from the Use and Disposal of Wood Residue in British Columbia and the Yukon*. Canadian Department of Fisheries and Oceans Technical Report No 2296. The report is available from web site http://www.dfo-mpo.gc.ca/Library/243104.pdf.

Residual risk:
Consequence: Minor
Likelihood: Possible
Risk Rating: Moderate