Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

Division 3, Part V *Environmental Protection Act 1986*

Works Approval Number	W6309/2019/1
Applicant	City of Greater Geraldton
ABN	55 907 677 173
File Number	DER2018/000553-1
Premises	Meru Waste Disposal Facility Landfill Lane, Narngulu WA 6532 Legal description - Lot 203 on Deposited Plan 403161; Lot 204 on Deposited Plan 403161; and Lot 2268 on Deposited Plan 250829
Date of Report	16 January 2020
Status of Report	Final

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1. Definitions of terms and acronyms

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

Table 1: Definitions

Term	Definition
ABN	Australian Business Number
Category/ Categories/ Cat.	Categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department Administering the *Environmental Protection Act 1986* Locked Bag 10 JOONDALUP DC WA 6919 info@dwer.wa.gov.au
Decision Report	refers to this document.
Delegated Officer	an officer under section 20 of the EP Act.
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
Licence	Licence L9127/2018/1
m^3	cubic metres
NEPM	National Environmental Protection Measure
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Occupier	has the same meaning given to that term under the EP Act.
Prescribed Premises	has the same meaning given to that term under the EP Act.
Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report

Risk Event	As described in *Guidance Statement: Risk Assessment*
UDR	*Environmental Protection (Unauthorised Discharges) Regulations 2004* (WA)

2. Purpose and scope of assessment

On 24 September 2019, an application for a Works Approval (Application) was received by the Department of Water and Environmental Regulation (DWER) from the City of Greater Geraldton (Applicant) to construct infrastructure to process Food Organic and Garden Organic material (FOGO) located within Lot 204 on Plan 403161 and Lot 2268 on Plan 250829, Narngulu (Premises).

This Decision Report presents an assessment of potential environmental and public health risks from emissions and discharges from the construction and operation of the Premises in relation to the Application.

2.1 Application details

Table 2 lists the documents submitted during the assessment process.

Table 2: Documents and information submitted during the assessment process

Document/information description	Date received
Works Approval application and supporting information, City of Greater Geraldton: • Attachment 3A: Meru Waste Disposal Facility Works Approval - Composting Facility, Bowman and Associates Pty Ltd; • Appendix A: Composting Operations Management Plan, Bowman and Associates Pty Ltd; • Appendix B: Construction Specification – Composting Facility, Bowman and Associates Pty Ltd; • Appendix C: Design Drawings • Appendix D: Geotechnical Report, Blacktop Consulting Engineers; • Operational Management Plan, Bowman and Associates Pty Ltd	24 September 2019
Design modification, City of Greater Geraldton	11 November 2019

3. Background

On 24 September 2019, an Application DWER from the Applicant to construct infrastructure to process Food Organic and Garden Organic (FOGO) material within the existing Prescribed Premises operating as a Class III landfill under Licence Number L9127/2018/1 (Licence). The Applicant proposes to process 500 tonnes of FOGO material for composting, over a twelve month trial period, upon a concrete pad with bunker system.

The existing Licence authorises Category 67A: Compost manufacturing and soil blending operations currently; however, infrastructure relating to the proposed activity, including time limited operations, is to be assessed through this Decision Report.

Table 3 summarises the classification and approved capacity for the Prescribed Premises in relation to the Application.

Table 3: Classification of premises and assessed design capacity

Classification of Premises	Description	*Approved Premises production or design capacity or throughput*
Category 64	Class II or Class III Putrescible Landfill site	100,000 tonnes per year
Category 61	Liquid waste facility	4,000 tonnes per year
Category 61A	Solid waste facility	100,000 tonnes per year
Category 67A	Compost manufacturing and soil blending	20,000 tonnes per year
Category 13	Crushing of building material	20,000 tonnes per year
Category 57	Used Tyre Storage (general)	1,000 tyres

4. Overview of Premises

4.1 Operational aspects

The Applicant owns the Meru Waste Disposal Facility, which is operated by Toxfree, and is located on Lot 2227 on Plan 254611 and Lot 2268 on Plan 250829, Narngulu. The Premises is located approximately 10 km to the south-east of the Geraldton Central Business District.

The Premises operates as a Class III landfill under Licence L9127/2018/1, consisting of

- Four waste cells with segregation by waste type;
- A liquid waste treatment facility, including two evaporation ponds;
- A stock-truck washdown bay and evaporation pond;
- A transfer station, including waste oil tanks;
- A household hazardous goods store;
- Greenwaste mulching area; and
- A Recycling Centre

The Applicant proposes to construct a new concrete pad with bunker system to accept and process FOGO within the Premises for a trial period of twelve months, whereby 500 dwellings within the Geraldton City region will be introduced with FOGO mobile garbage bins (MGBs).

The trial period will allow the Applicant to collect data and transition to an amendment of the Licence if the trial is successful.

The following information in relation to infrastructure and processes was submitted within the Application:

The proposed works will comprise a reinforced concrete slab for use as a hardstand for conditioning composting materials. The hardstand will be manufactured using type N40 MPa, 20 mm aggregate, 80 mm slump concrete reinforced with one layer of SL92 mesh with minimum 50 mm of cover. The concrete slab will be 350mm in thickness. The hardstand will be 15 wide by 25 long and will have a 2.0% cross fall to the centre of the pad and 2% slope to a concrete sump. The sump will be 1.6m deep with a run-off platform of 15m x 4.5m wide with a 1:10 slope which will allow for leachate overflow to be contained within the drainage area

and flow towards the sump. The concrete sump will be reinforced concrete of type N40 MPa. The walls and base will be 200mm thick with a single layer of SL92 mesh with minimum 65mm cover. The leachate sump will be pumped out and the leachate will be reuse onto the compost piles or be transferred to the existing liquid waste pond.

Ten concrete bunkers will be erected on the hardstand, with the sides of each bunker made from concrete block of dimensions similar to 800 mm x 600 mm x 500 mm. In the middle of the concrete pad, blocks of 1200mm x 600mm x 600mm will be placed to be used as a pushing platform for the loaders.

With respect to the composting process, the Applicant intends to use regular turning of the compost piles for aeration. As FOGO is involved in the feedstock, the composting windrows will be required to be covered with greenwaste during the early stages of maturation. It is proposed to use greenwaste as a bio-filter to treat the exhaust air emanating from the composting pile. At around 8 to 12 weeks or when the temperature drops to a static level, the mature compost is removed and screened for sale as compost.

The proposed feedstocks includes:

- FOGO waste – food waste and green waste collected in kerbside MGBs; and
- Greenwaste – including shrub trimmings, leaves, and branches mainly from gardens.

4.2 Infrastructure

The Applicant's infrastructure, as it relates to Category 67A activities, is detailed in Table 4, with reference to the Premises Map (attached in the Works Approval).

Table 4 lists infrastructure associated with each prescribed premises category in relation to the Application.

Table 4: Meru Waste Disposal facility Category 67A infrastructure

	Infrastructure	**Site Plan Reference**
	Prescribed Activity Infrastructure: Category 67A	
Compost manufacturing		
1	Concrete hardstand for the blending and composting processes	Site plan
2	Concrete bunkers for the acceptance and blending of compost	Site plan
3	Leachate sump	Site plan
4	Solids separator screen	Site plan
	Other infrastructure	
1	Security fence installed around the perimeter of the composting facility.	Site plan

Figure 1: Proposed site layout

Figure supplied as part of the Application

4.3 Contaminated sites

Lot 204 on Plan 403161 and Lot 2268 on Plan 250829, Narngulu are not listed on DWER's contaminated sites database.

4.4 Other relevant approvals

4.4.1 Planning approvals

The Prescribed Premises is zoned 'Public Purpose' under the City's Local Planning Scheme No. 1 (LPS1). The LPS1 also includes a buffer around the Meru Waste Disposal site, which is defined as 'Special Control Area 4 – Meru Waste Disposal Facility'.

The purpose, objectives and additional provisions with regard to SCA 4 have been outlined within the LPS1 and state that *"in considering any application the local government shall have regard to the need to protect the facility from encroachment..."*

DWER notes that the Environmental Assessment Guidelines '*Separation Distances between Industrial and Sensitive Land Uses'* August 2015 is currently in draft format and therefore the proposed separation distance of 1,000 m has not been formally endorsed. Given this, the document '*Separation Distances between Industrial and Sensitive Land Uses*' published in June 2005 is still applicable and has been used by the Applicant to determine separation distances.

4.4.2 Applicable regulations, standards and guidelines

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements which inform this assessment are:

- *Guidance Statement: Regulatory principles (July 2015)*
- *Guidance Statement: Setting conditions (October 2015)*
- *Guidance Statement: Environmental Standards (September 2016)*
- *Guidance Statement: Environmental Siting (November 2016)*
- *Guidance Statement: Land Use Planning (February 2017)*
- *Guidance Statement: Risk Assessments (February 2017)*
- *Guideline: Decision Making (June 2019)*
- *Guideline: Industry Regulation Guide to Licensing (June 2019*)

4.4.3 Works approval and licence history

Table 5 summarises the works approval and licence history for the premises.

Table 5: Works approval and licence history

Instrument	Issued	Nature and extent of works approval, licence or amendment
L6462/1992/12	29/04/2016	Amendment Notice – extension of licence duration to 11 December 2034
L6462/1992/12	12/01/2017	Amendment Notice 1 – Inclusion of additional categories within the existing licence.

L64621992/12	16/03/2018	Amendment Notice 2 - construction of a HDPE geomembrane liner within the western septage pond of the liquid waste facility and the acceptance of waste paint for temporary storage at the premises.
L6462/1992/12	2/05/2018	Amendment Notice 3 – construction of a new lined cell (No. 5) with leachate sump, leachate pond and storm water containment pond.
L9127/2018/1	1/06/2018	Replacement to Licence L6462/1992/12 which ceased due to the late payment of the annual fee. Administrative changes were made, including consolidation of previous Amendment Notices.
L9127/2018/1	12/02/2019	Amendment Notice 1 - extension of operational hours during the construction of Cell 5 and Septage Pond.

4.4.4 Clearing

No native vegetation clearing is required as a result of the proposed works.

5. Consultation

5.1 Stakeholder Consultation

The amendment application was advertised for public comment on the DWER website and in the West Australian on 28 October 2019 for a period of 21 days.

No submissions were received.

5.2 Applicant's comments

The Applicant was provided with the draft Works Approval on 23 December 2019. Comments received from the Applicant have been considered by the Delegated Officer as shown in Appendix 2.

6. Location and siting

6.1 Siting context

The Premises is located approximately 10 km to the south-east of the Geraldton Central Business District, located within Lots zoned as 'Public Purposes'. 'General industry' and 'Rural' zoned lots are adjacent to the Premises.

6.2 Residential and sensitive Premises

Table 6 below lists the relevant sensitive land uses in the vicinity of the Prescribed Premises which may be receptors relevant to the proposed amendment.

Table 6: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Residential receptor (rural	Approximately 1.1 km north-east from the proposed composting activity
Industrial receptors	Adjacent and east of premises boundary (within 'general industry' zoned area)

Groundwater bore user (Number: 20002600)	Approximately 900 m north of the prescribed premises boundary
Groundwater bore user (Number: 2000601)	Approximately 1.15 km south west of the prescribed premises boundary

6.3 Specified ecosystems

Specified ecosystems are areas of high conservation value and special significance that may be impacted as a result of activities at or Emissions and Discharges from the Premises. The distances to specified ecosystems are shown in Table 7. Table 7 also identifies the distances to other relevant ecosystem values which do not fit the definition of a specified ecosystem.

The table has also been modified to align with the *Guidance Statement: Environmental Siting.*

Table 7: Environmental values

Specified ecosystems	Distance from the Premises
Priority 1 Ecological Community: Coastal sands dominated by Acacia rostellifera, Eucalyptus oraria and Eucalyptus obtusiflora (Geraldton area)	2.5 km to the south-west of the composting activity

6.4 Groundwater and water sources

The distances to groundwater and water sources are shown in Table 8.

Table 8: Groundwater and water sources

Groundwater and water sources	Distance from Premises
Groundwater (Arrowsmith Groundwater Area)	Groundwater monitoring bore data for the premises has determined that depth to groundwater varies across the premises from 14.60 – 17.50 mBGL.
Major river - Nonperennial (Chapman River)	3.7 km to the north-east of premises
Minor river - Nonperennial (Greenough River)	1.9 km to the south of the premises
Surface water (Indian Ocean)	Approximately 4 km west of the prescribed premises boundary

6.5 Soil type

Table 9 details soil types and characteristics relevant to the assessment.

Table 9: Soil and sub-soil characteristics

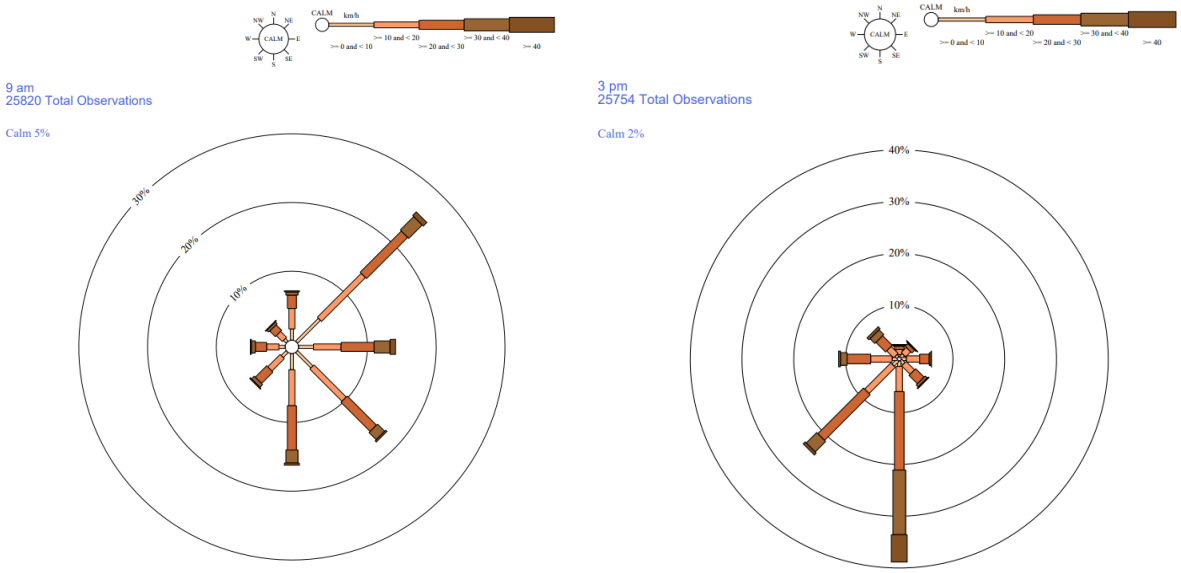
Soil classification	Description
Geraldton Rural-residential Land Capability Study	Soil within the Premises is described as level to very gently undulating prior alluvial depositional plain (1-3% slope), with red sandy and loamy duplex soils with Brown deep sands

6.6 Meteorology

6.6.1 Wind direction and strength

The closest available wind data for the Premises can be sourced from the Geraldton Airport Meteorology Site (Number 008051). The Bureau of Meteorology (BoM) provides the 9 am and 3 pm wind speed and direction for the Geraldton Airport Meteorology Site shown in Figure 2.

Figure 2. Geraldton Airport Meteorology Site 9 am and 3 pm wind roses (1941-2014)



6.6.2 Regional climatic aspects

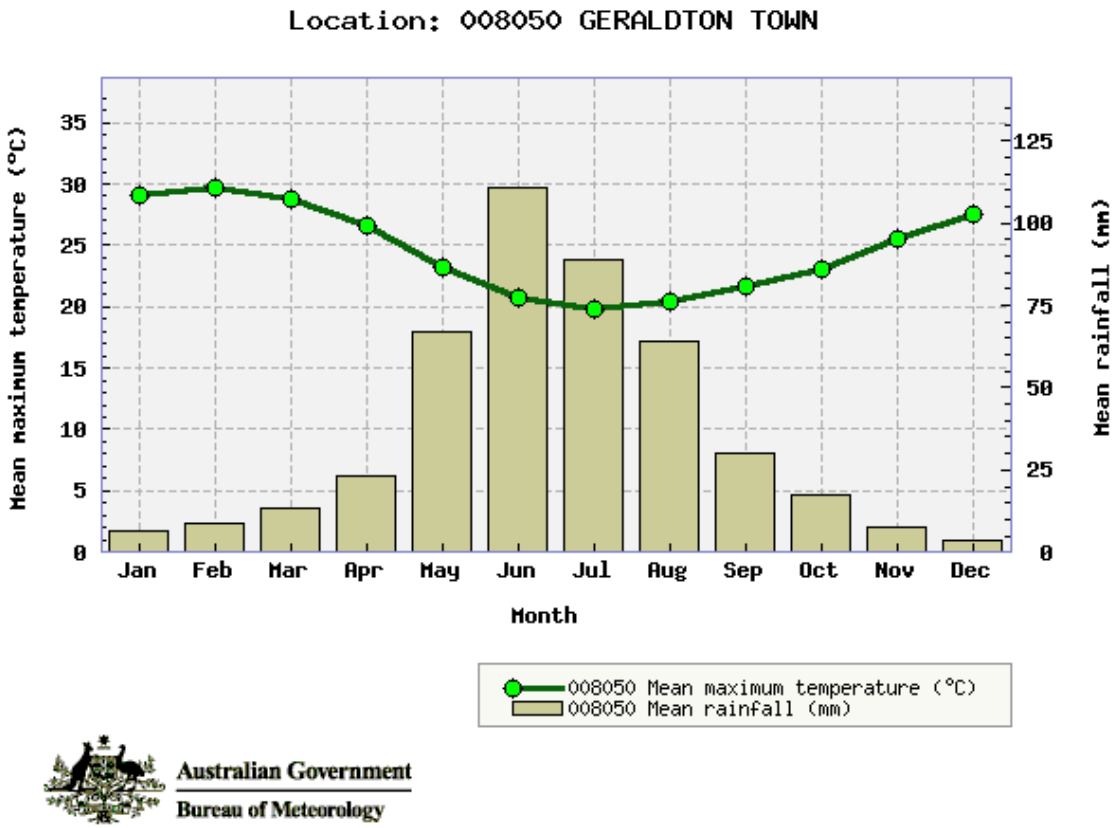
Geraldton has a Mediterranean climate with hot, dry summers and mild, wet winters. It experiences seasonal extremes in weather, from hot summer days with north easterly winds, to cold, wet, windy winter days as cold fronts roll in from the south west. Easterly winds prevail for most of the year with south westerly sea breezes common in the spring. Most of the region's rain falls during the winter months as cold fronts pass over from the south west.

6.6.3 Rainfall and temperature

Seasonal temperature variations range from mean daily maximum and minimum temperatures of 32°C and 19°C respectively in summer (February) with maximum temperatures in the low 40's on around nine occasions per summer period, to a mean daily maximum and minimum temperature of 20°C and 10°C respectively in winter (July/August).

Long term climatic data was obtained from the Geraldton Airport, approximately 3.5 km west of the Premises. Records dating from 1941 indicate that the long term average annual rainfall is 460 mm, which falls usually over 80 days annually. The wettest month is June with a long term average rainfall of 100 mm. Approximately 75% of the annual rainfall falls between the months of May to October. In contrast, the mean summer rainfall is just 5 mm per month where it rains on about four occasions over 3 months.

Figure 3: Mean maximum temperature and mean rainfall for Geraldton Town weather station



Australian Government
Bureau of Meteorology

7. Risk assessment

7.1 Determination of emission, pathway and receptor

In undertaking its risk assessment, DWER will identify all potential emissions pathways and potential receptors to establish whether there is a Risk Event which requires detailed risk assessment.

To establish a Risk Event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission. Where there is no actual or likely pathway and/or no receptor, the emission will be screened out and will not be considered as a Risk Event. In addition, where an emission has an actual or likely pathway and a receptor which may be adversely impacted, but that emission is regulated through other mechanisms such as Part IV of the EP Act, that emission will not be risk assessed further and will be screened out through Tables 10 and 11.

The identification of the sources, pathways and receptors to determine Risk Events are set out in Tables 10 and 11 below.

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

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Ground works, truck movements, installation and placement of equipment and infrastructure	Vehicle movements on unsealed access roads	Noise	Nearest resident is approximately 1.1 km north-east from the proposed composting activity	Air / wind dispersion	Amenity impacts	No	Noise is not considered likely to cause any distinguishable impacts at this distance. The Delegated Officer considers that the provisions of the Noise Regulations are sufficient to regulate noise emissions from vehicle movements.
		Dust			Air quality (adverse amenity and public health)	No	Dust is not considered likely to cause any distinguishable impacts at this distance. The Delegated Officer considers that the provisions of section 49 of the EP Act are sufficient to regulate dust emissions from vehicle movements

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Ground works, truck movements, installation and placement of equipment and infrastructure	Construction of new infrastructure	Noise	Nearest resident is approximately 1.1 km north-east from the proposed composting activity	Air / wind dispersion	Amenity impacts	No	Construction will only occur between 0730 and 1630 hrs. Noise is not considered likely to cause any distinguishable impacts at this distance. The Delegated Officer considers that the provisions of the Noise Regulations are sufficient to regulate noise emissions from construction activities.
		Dust	Nearest resident is approximately 1.1 km north-east from the proposed composting activity		Air quality (adverse amenity and public health)	No	Dust is not considered likely to cause any distinguishable impacts at this distance. The Delegated Officer considers that the provisions of section 49 of the EP Act are sufficient to regulate dust emissions from construction activities.
			Priority 1 Ecological Community: Coastal sands dominated by Acacia rostellifera, Eucalyptus oraria and Eucalyptus obtusiflora (Geraldton area) located 2.5 km to the south-west of the composting activity		Potential to be deposited on vegetation and may prevent photosynthesis and plant respiration	No	Materials excavated as part of the earthworks activities will be stockpiled within specific locations identified as causing minimum dust emission at the site boundary The surface of the hardstand will be sealed Unsealed roads, exposed areas and earthworks will be watered down regularly, or as required, to minimise windblown dust migration; All site traffic will, unless authorised, adhere to the site speed limit of 10 km/hr to minimize dust generated by vehicle movements; The Delegated Officer considers the minor amount of dust potentially generated will not cause distinguishable vegetation impacts at this distance.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Ground works, truck movements, installation and placement of equipment and infrastructure		Unforeseen hydrocarbon spill	Beneficial users of groundwater	Seepage from surface	Contamination of waters or deterioration of local/regional groundwater quality. Amenity and health impacts to users (potential potable, non-potable and stock water uses)	No	Minor fuel spillage is adequately regulated by the *Environmental Protection (Unauthorised Discharges) Regulations 2004*.
			Surface water ecosystems: Greenough River 1.9 km to the south of the premises	Transport and discharge of groundwater	Contamination of waters or deterioration of local/regional surface water ecosystems		
			Terrestrial ecosystems (soils and remnant native vegetation on and adjacent to premises)	Direct discharge to ground	Contamination of soil Degradation of terrestrial habitat		
			Sensitive receptors including nearby residences and industrial premises	Dispersal of vapours via air	Public health (adverse health)		

Table 11: Identification of emissions, pathway and receptors during operation*

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Category 67A: Composting activity Time limited operations for the composting of 500 tonnes of FOGO material	Waste acceptance, composting and vehicle movement	Dust	Nearest resident is approximately 1.1 km north-east from the proposed composting activity	Air / wind dispersion	Amenity impacts	No	All feedstock materials delivered to the premises will be contained in a covered vehicle The surface of the hardstand will be sealed Unsealed roads, exposed areas and earthworks will be watered down regularly, or as required, to minimise windblown dust migration; All site traffic will, unless authorised, adhere to the site speed limit of 10 km/hr to minimize dust generated by vehicle movements; Dust is not considered likely to cause any distinguishable impacts at this distance. The Delegated Officer considers that the provisions of section 49 of the EP Act are sufficient to regulate dust emissions associated with composting activities.
		Noise	Nearest resident is approximately 1.1 km north-east from the proposed composting activity	Air / wind dispersion	Air quality (adverse amenity and public health)	No	Noise is not considered likely to cause any distinguishable impacts at this distance. The Delegated Officer considers that the provisions of the Noise Regulations are sufficient to regulate noise emissions associated with composting activities.
	Composting-Application of liquid wastes, animal manure and other	Leachate	Groundwater	Overland flow, seepage and groundwater discharge	Reduction in soil and groundwater quality impacting upon dependent vegetation	Yes Refer to Section 7.6	Potential soil and groundwater contamination inhibiting vegetation growth and temporary loss of habitat

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
	raw materials Storage of leachate in a leachate pond		Premises lot and adjoining land	Overland flow, seepage into groundwater	Reduction in soil and groundwater quality impacting upon dependent vegetation	Yes Refer to Section 7.6	Potential soil and groundwater contamination inhibiting vegetation growth and temporary loss of habitat
			Contaminated stormwater runoff from the composting facility	Soil, surface water drainage and vegetation adjacent to the areas	Stormwater runoff may contain elevated metals, nutrients and other contaminants which may cause contamination of on and off-site and surface water drainage systems if leachate is not properly contained	Yes Refer to Section 7.6	Soil contamination inhibiting vegetation growth and survival, and health impacts to fauna
		Odour	Nearest resident is approximately 1.1 km north-east from the proposed composting activity	Air / wind dispersion	Amenity impacts	Yes Refer to Section 7.6	Potential adverse amenity impacts to sensitive receptors

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
		Vermin	Human receptors	Transmission by vectors	Human health impacts	No	Waste, especially household food waste, is a favoured source of food and habitat for some pests. FOGO deliveries are to be processed as soon as possible and not stored for more than 24 hours. FOGO, greenwaste and the bunkers shall be monitored regularly for infestation The composting facility is located within the L9127/2018/1 Meru Waste Disposal Facility premises, which maintains a fence and lockable gate around the perimeter of the premises. The security gate will be locked after hours to prevent foxes, cats and other larger pests from entering the premises. Detection of a pest problem will be followed quickly by action to get rid of the pests and to prevent similar future pest infestations. Actions may include chemical sprays, disposal of an infested batch of waste or other material to the active landfill, baiting, trapping and installing special covers or fences around problematic areas. The Delegated Officer has determined that the transmission of pathogens by vectors causing low level adverse health effects may only occur in exceptional circumstances.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
	Compost fires- Uncontrolled biogas emissions can create an explosion or fire risk at the facility and the surrounding land	Air emissions- particulates. noxious gases and smoke.	Adjacent properties	Air/wind dispersion; wind speed and direction can change the level of smoke generated	Destruction of flora and fauna	No	The site is not located within a bushfire prone area (as per https://maps.slip.wa.gov.au/landgate/bushfireprone/) The Licence Holder retains a Compost Facility Fire Procedure within its Composting Operations Management Plan. If emissions are released from a fire within the premises or from adjacent land, then the Delegated Officer has determined that the impact of the emissions of this fire will be of a mid-level local scale impact to amenity with low level health effects. Therefore, the Delegated Officer considers the consequence of air emissions during fire to be moderate. The Delegated Officer has determined that the likelihood of air emissions during a fire causing negative health impacts may only occur in exceptional circumstances. Therefore, the Delegated Officer considers the likelihood of air emissions during a compost fire causing negative health impacts to be rare. The Delegated Officer has compared the consequence and likelihood ratings described above and determined that the overall rating for the risk of compost fires is medium.

Risk Events						Continue to detailed risk assessment	Reasoning
Sources/Activities		Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
	Compost not meeting Australian Standard AS 4544 is taken off-site after sale	Elevated pathogens and contaminant levels	Human receptors, land, groundwater and surface water where compost will be applied	Direct application of compost	Any product supplied for off-site use may contain contaminant levels or pathogenic microorganisms including bacteria, viruses and helminths may cause contamination of off-site land, groundwater and surface water and/or health impacts to end users	Yes Refer to Section 7.5	Provided that the product is sold for the appropriate end use based on the product's pathogen grade, the Delegated Officer has determined that pathogens in the compost product causing high level adverse health effects for product users may only occur in exceptional circumstances.

7.2 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 12 below.

Table 11: Risk rating matrix

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

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 13 below.

Table 12: Risk criteria table

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **onsite impacts**: catastrophic • **offsite impacts local scale**: high level or above • **offsite impacts wider scale:** mid-level or above • Mid to long-term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **onsite impacts**: high level • **offsite impacts local scale**: mid-level • **offsite impacts wider scale**: low level • Short-term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid-level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	• **onsite impacts**: mid-level • **offsite impacts local scale**: low level • **offsite impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **Adverse health effects:** low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • **Local scale impacts:** mid-level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	• **onsite impacts**: low level • **offsite impacts local scale**: minimal • **offsite impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • **Local scale impacts:** low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	• **onsite impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity • Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*
* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines.*
"onsite" means within the Prescribed Premises boundary.

7.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 14 below:

Table 13: Risk treatment table

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

7.4 Risk Assessment – Leachate and contaminated runoff (Time-limited operations)

7.4.1 Description of Leachate and contaminated runoff

The proposed activities represents a significant potential for leachate and contaminated stormwater runoff generation from the acceptance and composting pad, and from the overflow/seepage of the leachate sump.

7.4.2 Identification and general characterisation of emission

Stormwater at the premises has the potential to become contaminated with leachate from the composting operation.

7.4.3 Description of potential adverse impact from the emission

Composts are produced on site from feedstocks which includes food waste and garden green waste which may contain elevated nutrients and other contaminants which may cause contamination of on and off-site land, surface water drainage system and groundwater if not properly contained.

7.4.4 Criteria for assessment

ANZECC / ARMCANZ 2000 provide recommended trigger values for environmental water

quality and the *Assessment and management of contaminated sites* provides ecological and human health assessment levels for soil.

7.4.5 Applicant/Licence Holder controls

This assessment has reviewed the following controls:

- Ten bunkers to receive and maturate the FOGO, made from mixed materials consisting of concrete blocks and retaining walls. The bunkers will be placed on a sealed hardstand with a cross fall of 2% to the middle of the pad and 1% to allow leachate to flow to the leachate sump. The leachate collected from the composting bunkers in the leachate sump will be used as required to provide additional moisture for the composting process. The leachate sump level will be controlled using a float switch on the pump. When a critical level is reached the leachate will be recirculated into the maturing piles or pumped to the nearby septage ponds.
- A reinforced concrete slab will be constructed for use as a hardstand for conditioning composting materials. The hardstand will be manufactured using type N40 MPa, 20 mm aggregate, 80 mm slump concrete reinforced with one layer of SL92 mesh with minimum 50 mm of cover. The concrete slab will be 350mm in thickness. The hardstand will be 15 m wide by 25 m long and will have a 2.0% cross fall to the centre of the pad and 2% slope to the sump. At the lowest point of the concrete hardstand will be constructed a concrete sump. The sump will be 1.6 m deep with a run-off platform of 15 m x 4.5 m wide with a 1:10 slope which will allow for leachate overflow to be contained within the drainage area and flow towards the sump. The concrete sump will be reinforced concrete of type N40 MPa. The walls and base will be 200mm thick with a single layer of SL92 mesh with minimum 65mm cover.
- The leachate sump will be visually inspected daily for contamination, erosion, leaks, damage, and pump operation, and to ensure that there is freeboard in the leachate sump at all times.

The Delegated Officer has reviewed the information regarding leachate and has found:

1. *A water balance model submitted as part of the Application demonstrates that the leachate sump has sufficient capacity to contain leachate generated from the proposed composting trial.*

7.4.6 Consequence

If Leachate and contaminated runoff risk event occurs, then the Delegated Officer has determined that the impact of Leachate and contaminated runoff will be most likely limited to off-site impacts at a local scale. Therefore, the Delegated Officer considers the consequence to be **moderate**.

7.4.7 Likelihood of Risk Event

The Delegated Officer has determined that based upon the proposed infrastructure and management actions the likelihood of Leachate and contaminated runoff risk event occurring will be unlikely. Therefore, the Delegated Officer considers the likelihood to be **unlikely**.

7.4.8 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 12) and determined that the overall rating for the risk of

Leachate and contaminated runoff risk event is **medium**.

7.5 Risk Assessment – Export of elevated pathogens and contaminant levels (Time-limited operations)

7.5.1 Description of export of elevated pathogens and contaminant levels

Based upon the inputs to the composting process any product supplied for off-site or on-site use may contain contaminant levels or pathogenic microorganisms including bacteria, viruses and helminths.

7.5.2 Description of potential adverse impact from the emission

Any products supplied for off-site use with elevated pathogen or contaminant levels may cause contamination of offsite land, groundwater and surface water and/or health impacts to end users.

7.5.3 Criteria for assessment

The criteria for quality of compost are those set out in Australian Standard AS 4454 *Composts, soil conditioners and mulches*.

7.5.4 Applicant/Licence Holder controls

This assessment has reviewed the following controls:

- The feedstock will only comprise FOGO and municipal greenwaste.
- Prior to placing feedstock in the bunkers, the feedstock will be inspected for contamination
- The contamination of incoming loads will be visually inspected to ensure that materials will comprise greater than 95% volume/volume (v/v) of organic waste and the maximum contamination would be limited to 5% v/v.
- Greenwaste will be visually inspected by a trained employee and any contaminated loads will be recorded with appropriate action taken by the Facility Supervisor.
- If incoming feedstock appears to be heavily contaminated it will not be used and sent to landfill for disposal.
- Materials considered to be contaminants include metals, plastics, other non-organic materials, treated organic materials unsuitable for composting, asbestos, materials contaminated with chemicals or petroleum, clinical waste, and other hazardous wastes.

The Delegated Officer has reviewed the information regarding export of elevated pathogens and contaminant levels and has found:

1. *That the relevant criteria for quality of compost are those set in Australian Standard AS 4454- Composts, soil conditioners and mulches.*
2. *The compost product produced at the premises is sold to the appropriate end user based on the product's contaminant grade.*

7.5.5 Consequence

The Delegated Officer has determined that potential impacts may include end user health

impacts requiring low-level or occasional medical treatment or low level, localised contamination. Therefore, the Delegated Officer considers the consequence to be **moderate**.

7.5.6 Likelihood of Risk Event

The Delegated Officer has determined that the likelihood of activities affecting human health and the environment is that it will occur only in extreme circumstances. Therefore, the Delegated Officer considers the likelihood to be **rare**.

7.5.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 12) and determined that the overall rating for the risk of exporting elevated pathogens and contaminants off-site from sale of compost is **medium**.

7.6 Risk Assessment – Odour (Time-limited operations)

7.6.1 Description of odour emission and impact

Feedstock accepted and processed at the Premises has the potential to produce odour emissions through the deposition of odorous loads and inadequate composting processes causing amenity impacts outside the Premises.

Factors that influence the emission rate of odour from the premises include the degree of pasteurisation and application of leachate to composting stockpiles.

Factors that affect air dispersion include odour emission rates, wind speed and direction, topography and meteorological conditions.

7.6.2 Description of potential adverse impact from the emission

Individual responses to odour may vary depending on age, health status, sensitivity and odour exposure patterns. Perceived odour intensity may increase or decrease on exposure. Community response to an odour can include annoyance, potentially leading to stress and loss of amenity. Exposure to repeated odour events can create a nuisance effect.

7.6.3 Criteria for assessment

There are no set threshold or concentration criteria for odour assessment. Under section 49(5) of the EP Act, it is an offence to emit or cause to be emitted, an unreasonable emission from any premises.

An unreasonable emission is defined in the EP Act (section 49(1)) as an emission or transmission of noise, odour or electromagnetic radiation which unreasonably interferes with the health, welfare, convenience, comfort or amenity of any person.

7.6.4 Applicant/Licence Holder controls

This assessment has reviewed the following controls:

- A 500 mm thick layer of greenwaste is proposed to act as a bio-filter over the FOGO waste to treat the exhaust air emanating from the composting pile. The layer of greenwaste provides a medium for aerobic bacteria to break down the odours before emission to atmosphere.
- Daily meteorological monitoring is undertaken, as part of the daily operations to assist with the planning of composting.

- The Dissolved Oxygen level in the composting pile is intended to be maintained above 1.0 ppm.
- On a daily basis, or after the temperature of the windrow has reduced to below 30°C, the feedstock in the bunker will be turned using a front end loader, providing aeration.
- The moisture content in the bio-filter media will be maintained at 50% to 60% of dry weight, and will be monitored using a monitoring probe every four hours of operation. If moisture levels are detected to be below 50%, water will be sprayed manually over the surface area of the bio-filter medium.
- Turning of the feedstock will occur after week two to blend the bio-filter material into the feedstock.
- A daily diary will record temperature, dissolved Oxygen and moisture levels.
- Mixing of compost piles will be conducted only once a week
- FOGO will not be stored for longer than 24 hours before being mixed
- Odour emitting activities will be stopped or limited during periods of high wind.

The Delegated Officer has reviewed the information regarding odour emissions and has found:

1. *The Application was referred for technical review, with the advice specifying that odour emissions generated during the time limited operations are likely to represent low risk due to the low volumes of FOGO waste handled; and*
2. *Maintaining the composting piles within specific ranges of temperature, moisture and dissolved oxygen are important in reducing the likelihood of odour impacts occurring.*

7.6.5 Consequence

The Delegated Officer has determined that potential impacts may low level local scale impact to amenity. Therefore, the Delegated Officer considers the consequence to be **minor**.

7.6.6 Likelihood of Risk Event

The Delegated Officer has determined that the likelihood of activities affecting human health and the environment is that it could occur at some time. Therefore, the Delegated Officer considers the likelihood to be **possible**.

7.6.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above with the risk rating matrix (Table 12) and determined that the overall rating for the risk of odour emissions from the composting activities is **medium**.

7.7 Summary of acceptability and treatment of Risk Events

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above, with the appropriate treatment and control, are set out in Table 15 below. Controls are described further in section 11.

Table 15: Risk assessment summary

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
1.	Leachate and contaminated runoff	Composting facility	Direct from the infrastructure	• The hardstand shall be manufactured using type N40 MPa concrete, 20 mm aggregate, 80 mm slump concrete reinforced with one layer of SL92 mesh with minimum 50 mm of cover; • The concrete slab must be 350 mm in thickness; • The hardstand is to be 15 m wide by 25 m in length and have a 2.0% cross fall to the centre of the pad and 2% slope to the leachate; • The leachate sump must be 1.6 m in depth with a run-off platform of 15 m by 4.5 m wide and a 1:10 slope to allow for leachate overflow to be contained within the drainage area and flow towards the sump; • The sump must be constructed of reinforced concrete of type N40 MPa; • The walls and base are to be 200 mm thick with a single layer of SL92 mesh with minimum 65 mm cover; • Composting leachate is collected within the leachate sump and returned to the composting process or removed to a septage pond.	Moderate consequence Unlikely likelihood **Medium Risk**	Acceptable subject to regulatory controls

	Description of Risk Event			Applicant controls	Risk rating	Acceptability with controls (conditions on instrument)
	Emission	**Source**	**Pathway/ Receptor (Impact)**			
2.	High contaminant and pathogenic levels	Compost from the facility sold off-site	Direct application of compost to land	• Process monitoring to meet pasteurisation requirements • Product end use is determined by the physical and chemical quality specifications required by AS 4454	Moderate consequence Rare likelihood **Medium risk**	Acceptable subject to proponent controls and process monitoring
3	Odour	Composting process	Air/wind	• Maintaining the composting piles within specific ranges of temperature, moisture and dissolved oxygen	Minor consequence Possible likelihood **Medium risk**	Acceptable subject to proponent controls and process monitoring

8. Regulatory controls

A summary of regulatory controls determined to be appropriate for the Risk Event is set out in Table 16. The risks are set out in the assessment in section 7 and the controls are detailed in this section. DWER will determine controls having regard to the adequacy of controls proposed by the Applicant. The conditions of the Works Approval will be set to give effect to the determined regulatory controls.

Table 16: Summary of regulatory controls to be applied

		Controls **(references are to sections below, setting out details of controls)**			
		8.1.1 Infrastructure and equipment	**8.1.2 Waste acceptance and throughput restrictions**	**8.1.3 Monitoring**	**8.1.4 Reports**
Risk Items (see risk analysis in section7)	**1. Leachate and contaminated run-off**	●	●	●	
	2. Contaminants and pathogens			●	●
	3. Odour			●	

8.1 Works Approval and time limited operation controls

The following controls will be imposed as conditions on the Works Approval to manage the risk of emissions from the construction and time limited operation of the composting facility. It should be noted that these controls are not final and will be subject to compliance with conditions of the Works Approval and may change if additional information becomes available to further inform the risk assessment (as per *Guidance Statement: Risk Assessments*).

8.1.1 Infrastructure and equipment to control contaminated runoff

The following environmental controls, infrastructure and equipment should be maintained and operated onsite for control of contaminated runoff:

- Concrete hardstand graded to collect leachate within a leachate sump;
- Concrete leachate sump; and
- Maintaining the leachate sump to be free of debris and accumulated sediment.

8.1.2 Waste acceptance and throughput restrictions

The Works Approval Holder shall be subject to total annual limits on throughput of waste materials.

Table 17: Composting inputs

Waste type	Rate at which waste is received	Acceptance specification
Food organics and garden organics	Combined total up to 5,000 tonnes per annual period.	Accepted from municipal mobile garbage bins only

The Works Approval Holder will contain the following processing controls:

- Visual inspection of all waste upon arrival at the premises;
- Waste acceptance and compost processing to only occur within the hardstand compost facility;
- Waste shall not be stored for longer than 24 hours before being added to the composting process; and
- Maintain physical parameters of the compost piles.

8.1.3 Monitoring requirements

The Works Approval includes the following monitoring conditions to reduce the likelihood of odour impacts form composting processes and that off-site application of compost does not cause health or environment damage:

- Monitoring of physical parameters of the compost piles;
- Testing of final products to AS 4454 standards; and
- Recording waste acceptance to the premises and product volumes leaving the premises.

It is noted that while technical advice specified that the time limited operations are likely to represent low odour risk due to the low volumes of FOGO waste handled, the risk may rise substantially for the operation at a larger scale. As such, further technical review is being undertaken on the future state of the facility and its management. Upon submission of the potential licence application following the time limited operations, assessment will occur based on the proposed volumes of compost produced, with further regulatory controls relating to odour likely to be included in the future licence.

8.1.4 Reporting

The Works Approval Holder will contain the following reporting requirements:

- Submission of an Environmental Compliance Report following completion of works; and
- Submission of a report on the Time Limited Operations following completion of the time limited operations.

An Annual Audit Compliance Report will be required to be submitted as a condition of the future Licence.

9. Determination of Works Approval conditions

The conditions in the issued Works Approval have been determined in accordance with the *Guidance Statement: Setting Conditions*.

The *Guidance Statement: Licence Duration* has been applied and the issued Works Approval expires in 3 years from date of issue.

Table 148: Summary of conditions to be applied

Condition Reference	Grounds
Infrastructure and Equipment 1 and 2	These conditions are valid, risk-based and contain appropriate controls.
Time limited operations 5 and 6	This condition is valid, risk-based and consistent with the EP Act.
Emissions 9, 10, 11, 12, 13, 14, 15, and 16	This condition is valid, risk-based and consistent with the EP Act.
Information 3, 4, 7, 8, 17, 18, 19, 20 and 21	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

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

10. Conclusion

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

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

Stephen Checker

Digitally signed by Stephen Checker
Date: 2020.01.17 18:17:43 +08'00'

Steve Checker
A/SENIOR MANAGER WASTE INDUSTRIES
Delegated Officer under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

	Document title	In text ref	Availability
1.	Works Approval application and supporting information, City of Greater Geraldton, received on 24 September 2019: • Attachment 3A: Meru Waste Disposal Facility Works Approval - Composting Facility, Bowman and Associates Pty Ltd; • Appendix A: Composting Operations Management Plan, Bowman and Associates Pty Ltd; • Appendix B: Construction Specification – Composting Facility, Bowman and Associates Pty Ltd; • Appendix C: Design Drawings • Appendix D: Geotechnical Report, Blacktop Consulting Engineers; • Operational Management Plan, Bowman and Associates Pty Ltd	Application	DWER records (DWERDT204772)
2.	Design modification, City of Greater Geraldton, received on 11 November 2019	Design modification	DWER records (A1845917)
3.	DER, July 2015. *Guidance Statement: Regulatory principles.* Department of Environment Regulation, Perth.	DER 2015a	Accessed at: www.dwer.wa.gov.au
4.	DER, October 2015. *Guidance Statement: Setting conditions.* Department of Environment Regulation, Perth.	DER 2015b	
5.	DER, May 2016. *Guidance Statement: Publication of Annual Audit Compliance Reports.* Department of Environment Regulation, Perth.	DER 2016a	
6.	DER, August 2016. *Guidance Statement: Licence duration.* Department of Environment Regulation, Perth.	DER 2016b	
7.	DER, September 2016. *Guidance Statement: Environmental Standards.* Department of Environment Regulation, Perth.	DER 2016c	

8.	DER, November 2016. *Guidance Statement: Environmental Siting.* Department of Environment Regulation, Perth.	DER 2016d	
9.	DER, February 2017. *Guidance Statement: Land Use Planning.* Department of Environment Regulation, Perth.	DER 2017a	
10.	DER, February 2017. *Guidance Statement: Risk Assessments*. Department of Environment Regulation, Perth.	DER 2017b	
11.	DWER, June 2019. *Guideline: Decision Making.* Department of Water and Environmental Regulation, Perth.	DWER 2019a	
12.	DWER, June 2019. *Guideline: Industry Regulation Guide to Licensing.* Department of Water and Environmental Regulation, Perth.	DWER 2019b	
13.	Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand (ANZECC & ARMCANZ) (2000). Australian Water Quality Guidelines for Fresh and Marine Water Quality	ANZECC / ARMCANZ 2000	Accessed at: http://www.agriculture.gov.au/SiteCollectionDocuments/water/nwqmsguideline-4-vol1.pdf
14.	Standards Australia, 2012. *Australian Standard AS 4454-2012 Compost, soil conditioners and mulches*.	AS 4454	Purchased at: https://infostore.saiglobal.com/enau/standards/as-4454-2012-121773_SAIG_AS_AS_267608/

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

Condition	Summary of Licence Holder comment	DWER response
1	The leachate sump, as per the design modification received on 11 November 2019, is 1.6 metres in depth, rather than 3.6 metres.	The infrastructure requirement for the depth of the leachate sump has been corrected to be consistent with the design modification.
13 (Table 4)	Temperature monitoring of compost piles is to be undertaken daily to ensure the core temperature of the composting pile is maintained above between 55 ºC and 65 ºC for a period of at least three consecutive days.	Table 4 has been amended to require daily monitoring of temperature of the compost piles.