Environmental Assessment & Management Plan

Red Hill Waste Management Facility - Garden Organics Relocation

Prepared for Eastern Metropolitan Regional Council

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Project Number: TW24074

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1 Introduction

The Eastern Metropolitan Regional Council (EMRC) is progressing with the relocation of the new garden organics (GO) processing area at its Red Hill Waste Management Facility (the Site). The existing GO Processing Area is located within Lot 12, which has been earmarked for future Class III landfill operations. Therefore, EMRC is proposing to relocate operations to Lots 9 and 10. This land was purchased by EMRC in 2012 but has not been included within the prescribed premises boundary for the Site.

Therefore, a Works Approval from the Department of Water and Environmental Regulation (DWER) is required for construction and time-limited operations of the GO Processing Area at the new location. Note that the throughput through the facility will remain the same. As part of this application, it is also requested that the prescribed premises boundary is extended to include Lots 8, 9 and 10 in their entirety.

This Environmental Assessment and Management Plan (EAMP) has been prepared to support the Works Approval application for the relocation of the GO Processing Area by outlining the existing environmental attributes, detailed designs, proposed construction works, and environmental management measures to be implemented.

In December 2024, EMRC submitted a separate Section 45C application to the Environmental Protection Authority (EPA) to allow for the extension of current Ministerial Statement 274 to incorporate parts of Lots 8, 9 and 10, including the new GO processing area.

1.1 Objective

The objectives of this EAMP are to:

- Provide the design, construction and operational details of the GO processing area;
- Outline the environmental and social aspects requiring management;
- Describe how the proposed environmental performance objectives in accordance with DWER's *Guideline: Better practice organics recycling* (2022) are met;
- Undertake a residual risk assessment in accordance with the DWER's *Guidance Statement: Risk Assessments* (2017); and
- Demonstrate that the proposed management measures adequately manage potential environmental risks.

1.2 Scope of Report

The scope of this EAMP includes:

- Section 2: Background
- Section 3: Site Information
- Section 4: Environmental & Social Attributes
- Section 5: Infrastructure Layout & Design
- Section 6: Infrastructure Operational Aspects
- Section 7: Environmental Performance Objectives and Management
- Section 8: Residual Risk Assessment
- Section 9: Conclusion

2 Background

The EMRC recognises the critical role of GO processing in driving resource recovery and reducing reliance on landfill. To support these objectives, the EMRC operates a food organics and garden organics (FOGO) and GO program for several member councils, ensuring sustainable waste management outcomes.

The current GO processing area is situated on a future landfill cell, requiring its relocation to enable the progression of landfill development at the Site. Relocating the GO Processing Area to a more suitable location is essential to ensure continuity of these vital services, with minimal disruption, while also meeting long-term waste disposal and resource recovery goals.

2.1 Stakeholder Consultation

Representatives from EMRC and Talis attended a scoping meeting with EPA and DWER representatives on 4 December 2024. Generally, the proposed works were considered reasonable and straightforward. DWER representatives requested that its *Guideline: Better Practice Organics Recycling* and *Guideline: Odour Emissions* are specifically addressed in this supporting documentation, which is discussed further in Sections 2.2 and 2.3.

The EMRC has held a meeting with the Waste Management Community Reference Group on Monday 16 December 2023 and the GO Relocation and the Interim Food Organics Garden Organics (FOGO) processing expansion plan were included in the agenda for that meeting.

2.2 Better Practice Organics Guideline

The DWER *Guideline: Better Practice Organics Recycling* (Organics Guideline) provides comprehensive recommendations for organics recycling facilities in Western Australia (WA). It is intended to enhance environmental management, public health, and compliance with regulatory requirements under the Environmental Protection Act 1986 (EP Act) and the Waste Avoidance and Resource Recovery Strategy 2030. The purpose of the Organics Guideline is to define better practices for facilities managing organic waste, including composting, anaerobic digestion, and vermiculture. It is applicable to prescribed premises under Categories 61A (solid waste facilities) and 67A (compost manufacturing and soil blending) and therefore has been considered as part of this Works Approval application.

2.3 Odour Emissions Guideline

The DWER *Guideline: Odour Emissions* (Odour Guideline) provides advice to ensure adequate odour data and information are given to DWER when assessing odour impact as part of an application under Part V of the EP Act. If a proposed project has the potential to generate odour emissions, then a desktop screening analysis can be undertaken to determine if a more detailed analysis is required.

The screening analysis primarily involves comparison of the screening distance with the sensitive receptor distance, providing a conservative desktop indication as to whether odour is likely to be an issue. The screening analysis is comprised of three steps:

- Step 1: Complete the questionnaire relevant to the application (for new or existing premises);
- Step 2: Use the flowchart and questionnaire responses to determine whether a detailed analysis is required; and

- Step 3: Compile information to support the screening analysis. This may include maps of sources and receptors, topographical maps, specifications for proposed emissions controls and details of screening distance calculations.

The results of the desktop screening analysis for an existing premises is discussed in Section 7.2.5 and the completed screening analysis questionnaire is provided in Appendix D. Overall, it was determined that a detailed odour analysis was deemed not to be required for this proposal.

3 Site Information

The following sections provide details on the Site's location, zoning and surrounding land use, separation distances, licencing, and existing infrastructure.

3.1 Site Location

The Site is located approximately 16km (23km by road) northeast of the Perth Airport at 1094 Toodyay Road, Red Hill, WA 6056. The prescribed premises boundary, as shown in Site Licence L8889/2015/1, bounds an area across four lots, approximately 352 hectares (ha). The Site includes Lots 1, 2 and 11 as well as a section of Lot 12. Lots 8, 9, and 10, the land directly west of Lot 11, were acquired by EMRC in December 2012 and cover an area of approximately 37ha. It is now requested that these lots be incorporated into the existing prescribed premises boundary. Access to the Site is from Toodyay Road and allows vehicles to enter and exit from the northwest corner of Lot 11.

The Site locality is provided in Figure 1.

3.2 Site Layout and Infrastructure

The Site is owned and managed by the EMRC and has been in operation since 1981. The EMRC's existing Site infrastructure includes:

- Weighbridge;
- Administration Office;
- Maintenance Workshop;
- Red Hill Waste Education Centre;
- Red Hill Transfer Station;
- Household Hazardous Waste Storage Area;
- GO Processing Area;
- FOGO Interim Facility (Stage 1);
- Class III Landfills Cells:
  - Stages 1-17
  - Farm Stages 1 & 2; and
- Class IV Landfill Cells:
  - Stages 1 & 2.

The GO Processing Area currently consists of a clay-lined hardstand and utilises open-windrow (aerobic) composting system as detailed in Section 6. The new location will feature a compacted hardstand with a leachate management system and there will no change in operations with the same throughput and product quality.

Figure 2 provides a general layout of the Site.

3.3 Site Licence

The Site is licenced for the acceptance and processing of GO, as specified in the Organics Guideline. The Site is classified as a Prescribed Premises pursuant to Schedule 1 of *Environmental Protection Regulations 1987* as an 'industrial premise with the potential to cause emissions and discharges to air, land or water'. Therefore, it operates under an approved Licence granted by the DWER. The categories covered under the Site Licence are listed in Table 3-1.

Table 3-1: Summary of Prescribed Premise Categories

Category Number	Category Description	Approved Premises Production or Design Capacity
12	Screening, etc. of material	200,000 tonnes per annum (tpa)
61A	Solid waste facility	13,000tpa
62	Solid waste depot	10,000tpa
64	Class II or III putrescible landfill site	350,000tpa
65	Class IV secure landfill site	Not applicable
67A	Compost manufacturing and soil blending	58,000 tpa (Greenwaste/GO: 28,000tpa / FOGO: 30,000tpa)

There are several conditions that relate to greenwaste/GO processing at the Site, which are outlined in Table 3-2. EMRC is not proposing any amendments to the Site Licence with regards to greenwaste/GO processing.

Table 3-2: Greenwaste/GO Processing Licence Conditions

Licence Reference	Description
Condition 4, Table 2: Greenwaste/GO leachate pond	Managed such that a freeboard equal to or greater than 500 mm is maintained. The following operational controls are implemented to maintain the specified minimum freeboard: • weekly inspection by site personnel to assess and record compliance with the freeboard requirement in this table; • infrastructure in place to pump excess leachate to the Class III leachate ponds (as shown in Figure 2); and • excess leachate is managed by pumping to the Class III leachate ponds (as shown in Figure 2).
Condition 4, Table 2: Greenwaste/GO processing hardstand	Areas used for the storage of Greenwaste/GO, FOGO waste, materials undergoing composting and Composting Products must be: • bunded to divert stormwater run-off from entering the hardstand; • bunded and maintained to contain leachate, drain it to the greenwaste/GO leachate pond and prevent leachate drainage to the temporary laydown area; and • graded and maintained to prevent pooling of leachate and achieve drainage to the greenwaste/GO leachate pond.
	Located at least 25 m from the premises boundary and 25 m from any area being used for landfilling operations.
Condition 5, Table 3	Receipt, handling, storage and mulching or composting for on-site use, removal offsite or disposal:

Greenwaste/GO waste type	• Greenwaste/GO is stored at the premises only for the purpose of mulching or composting for on-site use, or for removal from the premises. • Unprocessed Greenwaste/GO may be stored on the temporary laydown area for a maximum period of two weeks (14 days) or on the greenwaste/GO processing hardstand. • All Greenwaste/GO being composted and all Composting Products are stored and processed on the greenwaste/GO processing hardstand. • All Greenwaste/GO, materials undergoing composting and Composting Products stored on the greenwaste/GO processing hardstand or temporary laydown area are stored in windrows. • Windrows of Greenwaste/GO are no more than 3 metres high and no more than 4 metres wide and separated by at least 4.5 metres of clear ground from any other row or from any other combustible waste. • Windrows of Greenwaste/GO and materials undergoing composting are maintained in an aerobic state. • Windrows of Greenwaste/GO and materials undergoing composting must be kept in a damp state and regularly inspected to check for any smouldering or smoke.
Condition 6, Table 4, Leachate from the greenwaste/GO processing hardstand	Directed to the greenwaste/GO leachate pond for evaporation or transfer to the Class III leachate ponds for evaporation

In addition, the EMRC are requesting that the Prescribed Premises boundary is extended to include Lots 8, 9 and 10 in their entirety as shown in Figure 16.

3.4 Current Waste Types and Volumes

The majority of the GO accepted at the Site originates from:

- Residential properties and small businesses within the EMRC's four member councils which include Bayswater, Mundaring, Swan and Bassendean;
- Parks and gardens landscaping activities; and
- Red Hill transfer station drop-offs.

Accepted materials include grass clippings, leaves, small prunings, flowers, bedding plants, weeds, and branches less than 1.5 metres (m) long and 300 millimetres (mm) in diameter. Based on the Site Licence, approximately 10,000m^3 or 28,000 tonnes of GO is approved to be processed annually into mulch and sold to various markets.

EMRC is not proposing to accept additional tonnages at the time of this application.

3.5 Zoning and Surrounding Land Use

The Site is zoned as 'Special Use Zone No. 9' under the City of Swan's Local Planning Scheme No. 17 (Map 05), and 'Rural' under the Metropolitan Regional Scheme (Map 13). To the southwest is John

Forrest National Park and to the southeast and to the east are the Hidden Valley Estate and Barbarich Estate subdivisions. Single large lot residences are located to the northeast. To the northwest and west, the lands are earmarked for resource and industry.

Figure 3 highlights the zoning and land use tenure around the Site.

3.6 Separation Distances

The Environmental Protection Authority (EPA's) *Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses (2005)* (Guidance Statement 3) contains the recommended separation distances between industrial activities, including waste management facilities, and sensitive land uses. Sensitive land uses are defined by the EPA as those that are sensitive to industrial emissions and include residential developments, schools, hospitals, shopping centres and other public areas and buildings. Table 2-1 provides the recommended minimum separation distances between sensitive land uses and the Prescribed Premises categories that is relevant to this application and for which the Site is currently licenced.

Table 3-3: Recommended Separation Distances between Industrial and Sensitive Land Uses

Category No.	Industry	Impacts					Recommended Separation Distance
		Gaseous	Noise	Dust	Odour	Risk	
67A	Compost manufacturing & soil blending		✓	✓	✓		150m for greenwaste/GO*

**Outdoor uncovered, regularly turned windrows*

The Site meets all separation distance requirements as summarised in Guidance Statement 3. The closest single residence is more than 900m south from the new GO Processing Area. The separation distances are illustrated in Figure 4.

4 Environmental & Social Attributes

4.1 Environmental Attributes

4.1.1 Climate

Climatic data sourced from the Bureau of Meteorology (BOM) for the period 1944-2023 for Perth Airport (Station ID 9021) located 6.2km from the Site is summarised in Table 4-1.

Table 4-1: Climate Statistic Summary in Millimetres

Aspect	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Rainfall	10	15	16	39	96	154	155	118	72	43	26	11	758
90th Percentile Rainfall	28	34	43	76	166	232	218	165	106	79	54	25	945
Average Evaporation	316	269	239	150	93	66	65	81	111	167	228	282	2,081

The Site experiences a temperate climate with distinctly hot dry summers and mild wet winters. Rainfall in the area typically falls during the winter months of April to October. The driest months are November to March. The mean annual pan evaporation rate is approximately 2,000mm, which exceeds annual average rainfall by about 1,300mm.

The wind direction generally ranges from north-east to east in the morning (9am), changing direction to westerly and south-westerly in the afternoon (3pm). Winds at the Site are typically gentle to moderate in the morning and the afternoon. The wind rose for morning and afternoon winds can be seen in Diagram 4-1.

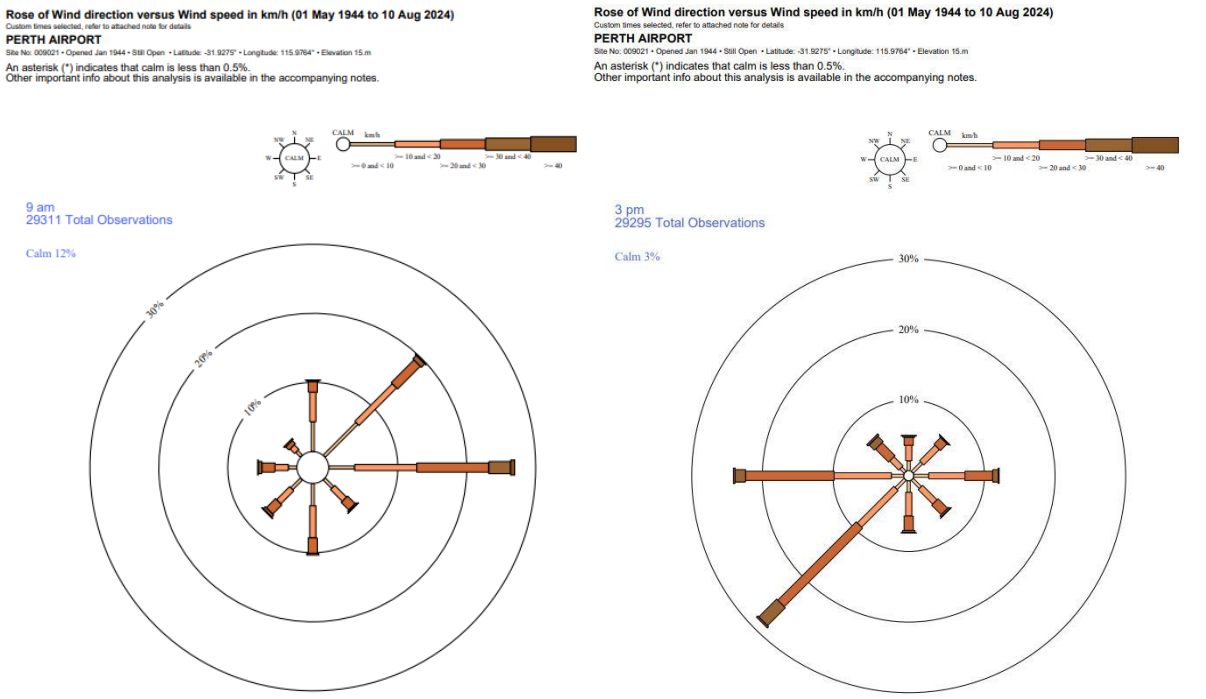

Diagram 4-1: 9am (left) and 3pm (right) Wind Rose for Perth Airport Station

4.1.2 Short Duration Design Rainfall

Rainfall Intensity Frequency Duration (IFD) data for the Site was obtained using the BOM Computerised Design IFD Rainfall System (CDIRS) and the Australian Rainfall and Runoff 2016 database (ARR2016). CDIRS produces a complete set of IFD curves and associated weather data based on user-defined coordinates (http://www.bom.gov.au/water/designRainfalls/revised-ifd/?year=2016).

Table 4-2 summarises the Annual Exceedance Probability (AEP) of storms with 1 to 72-hour (hr) durations. AEPs are required to estimate precipitation rates for a range of events.

Table 4-2: Summary of Annual Exceedance Probabilities for Red Hill, WA (ARR2016)

Storm Duration	1 in 10	1 in 20	1 in 50	1 in 100
	10%	5%	2%	1%
	Rainfall Depth (mm)			
1 hour	27.8	31.9	37.8	42.6
2 hour	35.8	41.3	49.3	56.2
3 hour	41.8	48.4	58.3	66.9
6 hour	55.1	64.3	78.4	90.9
12 hour	72.5	84.7	104	121
24 hour	93.4	108	131	151
48 hour	116	132	156	177
72 hour	132	147	172	191

4.1.3 Topography

The topography across the whole Site varies significantly from 246m Australian Height Datum (AHD) to 304mAHD. In the 500m buffer region between the Barbarich Estate subdivision and Site operations, there is a small valley in the centre. From the valley, the topography steadily increases going from the southeast to the northwest. The highest point at the Site is the centre of Lot 1 at the top of an existing Class III landfill.

The existing topography within the new GO Processing Area is consistent between approximately 262-264mAHD and is shown in Figure 5, available in Appendix A.

4.1.4 Geology

The Geological Survey of Western Australia (GSWA), 1:50,000 Environmental Geology Series (Sheet No. 2134) indicates the surface geology at the Site mostly comprises a Tertiary lateritic profile overlying dolerite intruded Archaean granite as follows:

- Laterite (LA1) – massive, hard, cemented, vuggy and pisolitic; up to 4m thick, overlain by and associated with gravels of residual origin;
- Gravel (G2) – yellow-brown to reddish brown, loose, fine to coarse, ferruginous pisolites, poorly sorted; variable amounts of sand and silt in matrix, minor re-cementation; of colluvial origin;
- Clayey Gravelly Sand (Sgc) – grey and yellow, kaolinitic, decomposed bedrock, sand and gravel veneer; granitic/gneissic origin;
- Granite (GR) - fine to coarse-grained, occasionally porphyritic granite, granodiorite and adamellite; and
- Dolerite (DO) – fine to medium-grained, sub vertical dykes up to 10m wide, associated with granites and gneiss.

Pleistocene alluvium (Msc2), and colluvium (Sgc) on steeper slopes, is present along drainage lines associated Strelley Brook and Christmas Tree Creek and granite outcrops along erosional surfaces.

There are several geological profiles present across the Site, with the two dominant layers being described as laterite and granites. The layer of laterite is “massive, hard, cemented, vuggy and pisolitic”, and can be up to 2.5-3m thick. The layer of granites is defined as “fine to coarse-grained, occasionally porphyritic rocks of granite”. There is a small layer of clayey sandy silt along the northern sections of Lots 8, 9, and 10. The surface geology is also underlain by granitic bedrock of the Yilgarn Craton.

Within the new GO Processing Area the geological profiles present are laterite in the southern half and gravel in the northern half. However, the area has historically been heavily disturbed due to quarrying operations prior to EMRC’s acquisition of the land in 2012. In 2020-2021, EMRC undertook extensive earthworks to fill in a series of quarry excavations with Site-won soil material, developing a usable construction pad for future waste management activities.

The geological data for the Site is illustrated within Figure 6.

4.1.5 Hydrogeology

4.1.5.1 *Groundwater Levels and Groundwater Flow*

According to previous groundwater monitoring assessments conducted by Talis at the Site, a total of 12 groundwater monitoring bores are active in close proximity to the new GO Processing Area of which 4 bores are located north and 8 south of this area. A groundwater contour plan has been developed

utilising all available data for these bores from 2022 and 2023 and it indicates that the long-term maximum groundwater level across the new GO Processing Area is between 246-258mAHD. The locations of these monitoring bores along with the groundwater contour lines are shown in Figure 7 with the data listed in Table 4-3.

Table 4-3: Groundwater Depth Summary

Bore ID	Historic Static Water Level (mAHD)	Historic Static Water Level (mbgl)	Year
EMRC9	252.309	1.559	2023
EMRC10	259.169	1.9395	2023
EMRC8	N/A	N/A	N/A
1S	265.68	0.84	2023
1D	264.835	1.715	2022
2D	248.932	5.725	2022
39S	N/A	N/A	N/A
40S	N/A	N/A	N/A
41S	N/A	N/A	N/A
34D	245.351	2.836	2022
35D	245.954	2.544	2022
25D	239.228	4.819	2022

Note: mAHD stands for metres Australian Height Datum, and mbgl represents metres below ground level

Based on the topography across the new GO Processing Area, the separation distance from the highest static water level recorded, as shown in Figure 7, is approximately 6mbgl at a minimum. This conforms with the Organics Guidelines which specify a minimum groundwater separation distance of 2m between the base of any containment infrastructure and the highest groundwater level.

4.1.5.2 *Groundwater Quality*

Groundwater quality sampling is now undertaken across the Site on a biannual basis and results are reported as required by Condition 26 of the Licence. Groundwater monitoring is undertaken in accordance with EMRC's Water Monitoring Procedure. Data gathered from monitoring bores located up- and down-gradient of the new GO Processing Area to date have maintained consistent background concentrations for all water quality parameters.

In 2006, routine monitoring detected contamination down gradient of the Class IV Stage 1 cell in Lot 1 and along the southern boundary of Lot 11. The Lot 1 contamination is localised whilst a recovery bore system has been implemented to remediate the Lot 11 contamination. Both areas of contamination have been investigated by groundwater consultants, are routinely reported under an accredited DWER contaminated sites auditor and are currently managed under the Site's Environmental Management System (EMS).

4.1.6 Hydrology

The Site is located within the Swan Avon Lower Swan Catchment at the intersection of three sub catchments; Jane Brook, Susannah Brook and Strelley Brook.

The Susannah Brook Catchment covers an approximately 55km^2 area with agriculture being the dominant land-use. Susannah Brook is an ephemeral stream that drains from the Darling Scarp in a

westerly direction into the upper reaches of the Swan River. At its closest point, it is 400m north of the Site. Jane Brook covers an area of 137km^2 with agriculture being the dominant land-use. The John Forest National Park exists in the middle of this catchment. Christmas Tree Creek, a tributary of Jane Brook, flows in a westerly direction parallel to the southern boundary of the Site. Strelley Brook, a small tributary of Jane Brook, located to the north-west of the Site flows in a westerly direction from the scarp and across the coastal plain into the wider Jane Brook catchment.

No natural surface water bodies are located within the Site. Surface water attenuation ponds are located around the Site to capture any surface water that does not come into contact with waste. Surface water settles within the siltation ponds to contain sediment prior to discharge.

The new GO Processing Area is located within the Jane Brook catchment and offsprings of the Christmas Tree Creek run along the Site boundary. Since Christmas Tree Creek is a non-perennial watercourse and is dry most of the year it does not pose significant environmental concern in relation to the new GO Processing Area.

The locations of the surface water bodies near the new GO Processing Area are provided in Figure 8.

4.1.7 Fauna, Flora and Vegetation

4.1.7.1 *Vegetation Unit and Condition*

Since the new GO Processing Area has already been cleared there is no vegetation left within.

4.1.7.2 *Threatened and Priority Ecological Communities*

In WA 'Threatened Ecological Communities' (TECs) are defined by the WA Threatened Ecological Communities Scientific Advisory Committee and are assigned to one of four categories (Presumed Totally Destroyed, Critically Endangered, Endangered, Vulnerable). While they are not afforded direct statutory protection at State level (unlike Declared Rare Flora under the Wildlife Conservation Act 1950) their significance is acknowledged through other State environmental approval processes (i.e., Environmental Impact Assessment process pursuant to Part IV of the EP Act 1986). Priority Ecological Communities (PECs) are ecological communities that are under consideration for listing as a TEC, but do not yet meet the criteria. The PEC is placed into a Priority Rating between 1-5 that ranks the PEC based on known occurrences, threats and management of the community.

The Department of Biodiversity Conservation and Attractions (DBCA) database search within the Site and its surroundings revealed an area of PECs extending 700m west of the new GO Processing Area as shown in Figure 9.

4.1.7.3 *Threatened and Priority Flora*

The DBCA database search within the Site and its surroundings revealed one Priority 4 flora northwest of the new GO Processing Area. However, no priority or threatened flora was identified within the Site itself.

The location of the Priority Flora is shown in Figure 9.

4.1.7.4 *Threatened and Priority Fauna*

The DBCA database search within the Site and its surroundings revealed four Priority 4 fauna and one Threatened species while four Threatened species were found south of the new GO Processing Area. The species found within the Site are located on the rehabilitated Class III landfill area and consequently not significant to the new GO Processing Area.

The location of the Threatened and Priority Fauna is shown in Figure 9.

4.1.7.5 *Environmentally Sensitive Areas*

Environmentally Sensitive Areas (ESAs) are declared in Environmental Protection (Clearing of Native Vegetation) Regulations 2004 as areas that cover any and/or all of the following conservation significant areas:

- A declared World Heritage property as defined in section 13 of the *Environment Protection and Biodiversity Conservation Act 1999*;
- An area that is included on the Register of the National Estate, because of its natural heritage value under the *Australian Heritage Council Act 2003*;
- A defined wetland and the area within 50 metres of the wetland;
- The area covered by vegetation within 50 metres of rare (threatened) flora, to the extent to which the vegetation is continuous with the vegetation in which the rare (threatened) flora is located;
- The area covered by a TEC;
- A Bush Forever site listed in "Bush Forever" Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site is approved to be developed by the Western Australia Planning Commission;
- The areas covered by the following policies:
    - The Environmental Protection (Gnangara Mound Crown Land) Policy 1992 - available from EPA website. This policy has been repealed;
    - The Environmental Protection (Western Swamp Tortoise) Policy 2002 - refer to the "EPP 2003 Western Swamp Tortoise Policy Boundary";
    - The areas covered by the lakes to which the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 applies. This policy has been repealed;
    - Protected wetlands as defined in the Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998. This policy has been repealed; and
    - Areas of fringing native vegetation in the policy area as defined in the Environmental Protection (Swan and Canning Rivers) Policy 1998. This policy has been repealed.

While the DBCA database search revealed no environmentally sensitive areas within the Site, the following are located in close proximity to the new GO Processing Area / Site boundaries:

- John Forrest National Park bordering the Site directly south of the new GO Processing Area;
- Environmental sensitive areas to the south and south west; and
- Bush forever areas to the south west.

These ESAs are shown in Figure 10.

4.1.7.6 *Bushfire Prone Areas*

The Department of Fire and Emergency Services (DFES) has developed Bushfire Prone Areas mapping to identify land in WA that has the potential to be impacted by bushfires. Additional planning and building requirements may apply to new developments within a Bushfire Prone Area. A further assessment of bushfire risk may also be required to ensure future developments in Bushfire Prone Areas are safer.

As shown in Figure 11, the Site is within a Bushfire Prone Area. However, since all vegetation in this area has been cleared this is not of significance. Fire management at the facility consists of strategies and actions related to both the prevention and control of fires. Prevention of the ignition or spread of fires into the facility is a high priority. EMRC has a Red Hill Emergency Management Preparedness and Response Plan, the objective of which is to provide fast and effective control of fires should they occur. The facility is well equipped to control small fires and employees are suitably trained in fire control techniques. In addition, the site's location enables a fast response time for the local Volunteer Bushfire Brigade and City of Swan Rangers. The EMRC has provided access and pumping equipment to one of the farm dams to the Volunteer Bushfire Brigade as an emergency water source for local onsite or offsite fires. The Red Hill Emergency Management Preparedness and Response Plan can be provided on request.

4.2 Social Attributes

The social attributes of the Site include Native Title, Aboriginal Heritage, European Heritage and Mining Tenements and are discussed in the following sections.

4.2.1 Native Title

Under Australian Law, Native Title is a form of land title that recognises the unique connections Aboriginal groups have to the land. Native Title exists where Aboriginal people have maintained a traditional connection to their land and waters, since sovereignty, and where acts of government have not removed it. A search of Landgate indicates that Native Title does not exist at the new GO Processing Area or in the surrounding area as shown in Figure 12.

4.2.2 Aboriginal Heritage

Aboriginal Heritage sites (registered or not) are protected under the *Aboriginal Heritage Act 1972* (AH Act) and the *Aboriginal Cultural Heritage Act 2021* (ACH Act). An Aboriginal Heritage Site under Section 5 of the AH Act is defined as:

> *(a) any place of importance and significance where persons of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made or adapted for use for, any purpose connected with the traditional cultural life of the Aboriginal people, past or present;*
>
> *(b) any sacred, ritual or ceremonial site, which is of importance and special significance to persons of Aboriginal descent;*
>
> *(c) any place which, in the opinion of the Committee, is or was associated with the Aboriginal people and which is of historical, anthropological, archaeological or ethnographical interest and should be preserved because of its importance and significance to the cultural heritage of the State;*
>
> *(d) any place where objects to which this Act applies are traditionally stored, or to which, under the provisions of this Act, such objects have been taken or removed.*

A search for relevant Aboriginal Heritage sites was conducted using the Department of Aboriginal Affairs (DAA) online Aboriginal Heritage Inquiry System (AHIS). Reported Aboriginal Heritage sites are categorised according to the assessment status of each place under the AH Act, as listed in Table 4-4.

Table 4-4: Aboriginal Heritage Site Assessment Categories

Category	Sub- Category	Assessment Status	Protected under the AH Act

Registered Aboriginal Site	N/A	Site has been assessed as meeting Section 5 of the AH Act	Yes
Other Registered Place	Lodged	Information has been received. Assessment has not been completed to determine if a site meets Section 5 of the AH Act	Yes (temporary)
	Stored Data/Not a Site	Site has been assessed as not meeting Section 5 of the AH Act	No

The results of the search indicated that the Site is located within an area classified as:

- 'Registered Aboriginal Site', Site 3721 Red Hill (Red Hill). Red Hill was assessed and met the Aboriginal Heritage Site definition under Section 5 of the AH Act.
- 'Other Registered Site', Site 3188 Darling Range (Darling Range). Darling Range was assessed and did not meet the Aboriginal Heritage Site definition under Section 5 of the AH Act and was categorised as 'Stored Data/Not a Site',
- There are more areas listed as 'Registered Aboriginal Site' northeast of the Site boundary which are not relevant to the development.

The aboriginal heritage areas are shown in Figure 13.

4.2.3 European Heritage

To protect cultural heritage places in WA, the Heritage Council maintain a list of places that are either 'Statutory Listings' or 'Other Listings and Surveys'. Statutory Listings are heritage places that can affect or may affect the use and development of land and buildings, and Other Listings and Surveys include heritage places that do not have any effect on the use and development of land and buildings (HC, 2017).

A search of the Government of Western Australia Heritage Council's inHerit online database indicated that there are no European Heritage sites located within the new GO Processing Area. However, bordering the new GO Processing Area to the south John Forrest National Park is considered under the Heritage Council WA State Register.

The European heritage areas are shown in Figure 14.

4.2.4 Mining Tenements

A review of the Department of Mines, Industry Regulation and Safety (DMIRS) mining tenement data indicated that the Site is not located within any category of mining tenement. The nearest exploration mining tenement is located more over 3km east of the Site boundary as shown in Figure 15.

5 Infrastructure Layout & Design

The GO processing infrastructure at the Site includes open windrow composting and mulching of source separated garden organics. Further discussion on the layout and design of the relocated GO processing area is provided in the following sub-sections.

5.1 Existing Infrastructure and Activities

At present there is no permanent infrastructure occurring within the extents of the relocated GO Processing Area, and no clearing is required to construct the new GO Processing Area. Approximately 60m² of vegetation clearing required for construction of auxiliary infrastructure in the northeast part of Lot 10 (access road).

5.2 Infrastructure Design

As part of its commitment to undertake best practice waste management, the EMRC proposes to construct and operate the relocated GO Processing Area in general accordance with the DWER Organics Guideline. Therefore, the proposed infrastructure is outlined as follows:

- Compacted ferricrete hardstand, which can be generally split into the three operational areas:
  - Receival area;
    - Stockpiling of raw materials.
  - Processing area:
    - Temporary shredding operations (undertaken by a third-party contractor)
    - Open-Windrows (cross section max. 6m x 3m and 4m apart in line with Site Licence);
  - Final product storage area.
- Environmental Controls:
  - Leachate collection and management system incorporating:
    - A designated leachate evaporation pond lined with an HDPE geomembrane with an overflow into the Site's existing leachate evaporation pond system; and
  - Surface water management system consisting of an open swale system connecting to the Site's existing surface water management system.
- Auxiliary infrastructure including access road network (unsealed initially and progressively sealed once financially feasible) and signage.

The infrastructure layout is shown in Drawing C-101.

5.2.1 Design Drawings

The concept design drawings for the relocated GO Processing Area are provided in Appendix A. The full list of design drawings is presented in Table 5-1.

Table 5-1: Concept Drawings

Drawing Reference	Description
C-000	Cover Sheet

C-100	Existing Topography
C-101	General Arrangement
C-102	Proposed GO Hardstand Plan Layout
C-301	Typical Sections and Details Sheet 1 of X

Note these designs are preliminary only and not for construction. Construction drawings will be prepared during the construction procurement process.

5.3 Construction Quality Assurance and Technical Specification

To ensure the materials and construction of the GO Hardstand meet the design criteria, a Construction Quality Assurance (CQA) plan and Technical Specification has been prepared, which is anticipated to be constructed in the 2025/26 financial year. The CQA plan details the testing methods and quality assurance procedures to construct the GO Hardstand and corresponding leachate pond. The Technical Specification details the earthworks, supply and installation of the lining system for the proposed leachate pond. Copies of the Technical Specification and CQA Plan are provided in Appendix B and Appendix C, respectively.

5.4 GO Processing Area Construction

5.4.1 Earthworks

5.4.1.1 *Historical Preliminary Earthworks*

Lots 8, 9 and 10 were part of a former kaolinite clay quarry having a total area of 36.9 ha. The majority of the premises had been cleared of native vegetation for quarrying operations, during which significant excavations were undertaken. Between April 2020 and January 2021, EMRC undertook preliminary earthworks to fill several of these excavations, predominately in the southern portion of these lots. The scope of works were as follows:

- Clearing of unsuitable materials from previously ponded areas;
- Exposing, removal and crushing of Laterite Cap Rock for use in the works;
- General fill earthworks to form construction pad (varying thicknesses, dependent on excavations);
- 200mm thick ferricrete erosion protection sheeting to cut slopes;
- 300mm thick ferricrete sub-base placement to construction pad; and
- Temporary surface water management controls & safety edge bunding.

Following the ground improvement works, the majority of the premises was made relatively level in preparation for use as the foundations for future waste management activities.

The in-situ and laboratory test results show that the works method utilised for both conditioning and compaction of the general and structural fill achieved the minimum dry density ratio / compaction level of 95%. The calculated permeability based on this compaction method was approximately between $1x10^{-9}$m/s to $3x10^{-10}$m/s, which is in line with the Organics Guideline. This is also similar to the design of the two hardstands for Site's Interim FOGO Processing Facility in Lot 11, previously approved by the DWER. The test rests are provided in the CQA Validation Report Appendix F.

5.4.1.2 *Proposed Earthworks*

To prepare the area for construction, any rubbish, debris or deleterious material will first be removed. There is no native vegetation clearing required within the proposed GO Processing Area footprint, but there is approximately 60m² of vegetation clearing required for proposed access road into Lot 10. All proposed infrastructure will be constructed and developed to the design formation levels and geometry, which will consist of placing additional ferricrete material over the existing 300mm ferricrete subbase to achieve design levels.

The development area will initially be within Lot 9, constrained by the premises boundaries within the EPA's Ministerial Statement (MS) 976 and MS462. There is a provision to use the northern portion of Lot 10 for operations, if required in future. The design of the surface water and leachate management systems (discussed further in Sections 5.4.3 and 5.4.4) have considered this potential extension as a conservative measure.

5.4.2 Hardstand Surfacing

The proposed hardstand area will initially be the current platform that was constructed in 2020-2021, consisting of compacted low-permeability soils overlain by crushed ferricrete. Once it is financially feasible, the hardstand area will progressively be a sealed surface with adequate pavement composition to withstand loading of processing operations in line with the Organics Guideline. For a clear separation between clean and potentially contaminated stormwater, the perimeter of the hardstand area will be isolated by a surface water management system, consisting of open channel swales.

5.4.3 Surface Water Management System

Swales will be utilised along internal access roads to effectively transport surface water runoff from non-processing areas to collection points for diversion into the existing surface water pond located north of the GO Processing Area.

Surface water collection within the GO Processing Area will be collected via a separate swale system circulating the perimeter of the proposed hardstand and directed to a leachate sump to the north of the hardstand.

A software program called *Drains* by Watercom will be utilised for all proposed surface water management infrastructure. *Drains* is a stormwater drainage system design and analysis software commonly used in civil/roadwork applications across Australia. An Initial Loss – Continuing Loss (IL-CL) hydrological model will be used with input data sourced from the Australian Rainfall and Runoff (ARR) Datahub (pervious area initial loss of 20.4mm and pervious area continuing loss of 4.3mm/hr). Stormwater pits in sag locations have been assumed to be 50% blocked during a storm event. A climate change rainfall multiplier of 1.203 is to be applied, which effectively increases the rainfall intensities by 20.3%. A one-dimensional unsteady hydraulic model is to be used in the flow calculations.

The draft layout and construction details of the surface water management system for GO Processing Area and access roads are shown in Drawings C-000, C-101, C-102 and C-301 (available in Appendix A).

5.4.4 Leachate Management System

To protect the surrounding environment and groundwater from contamination, a leachate treatment system will be constructed/installed consisting of a network of swales and culverts into a dedicated leachate evaporation pond to the north of the hardstand. The hardstand for the GO Processing Area

will be sloped towards a perimeter swale, which will discharge into a dedicated leachate evaporation pond to the north of the hardstand. This proposed design will ensure that any stormwater that comes into contact with GO material on the hardstand will be treated as leachate and managed accordingly.

5.4.4.1 *Leachate Evaporation Pond*

The design characteristics of the proposed evaporation pond are provided in Table 5-2. The results of the water balance assessment undertaken to size this pond are discussed in Section 7.2.3 and provided in Appendix E. Design characteristics of the proposed evaporation pond with consideration of additional catchment area to cater for potential future expansion at the north of Lot 10 are shown in Table 5-2.

Table 5-2: Leachate Evaporation Pond Design Characteristics

Approximate Dimensions [L x W x H] (m)	Catchment Area (m^2)	Evaporation Area* (m^2)	Operational Volume^o (m^3)	Total Volume (m^3)
100 x 26 x 2.5	2,600	1,440	3,118	4,325

**Maximum Evaporation Area is considered to be at 830mm freeboard from pond crest.*
^{o} Operational Volume is considered to be at 500mm freeboard from pond crest

The key elements of the dedicated leachate pond's lining system are as follows (in order of construction/installation):

- Minimum 500mm thick engineered attenuation layer; and
- 2mm double-textured HDPE geomembrane.

The design of the composite system is shown in the detailed drawings in Appendix A.

A minimum 500mm thick engineered attenuation layer has already been constructed during the preliminary earthworks (as discussed in Section 5.4.1.1) using site-won material, and it will provide a soil hydraulic barrier layer in the event the overlying geosynthetic lining system is compromised. The soil material was subject to conditioning, compaction and testing to ensure that it meets the design criteria. Field density tests were performed to monitor the quality and uniformity of the soil material placement and compaction. Tests were carried out by a NATA certified laboratory and all results were checked by the CQA Consultant and Superintendent appointed by the EMRC for the Project. These tests include, but are not limited to, moisture content, Atterberg limits, grading, dry density and permeability. Further details regarding the earthworks are detailed in the CQA Validation Report (available in Appendix F).

Conformance testing of the geosynthetic lining materials (HDPE geomembrane) will be undertaken prior to installation to ensure they meet the requirements outlined in the Technical Specification (available in Appendix B). Installation of the lining system will be undertaken by a qualified lining installer and supervised by a CQA consultant to ensure construction of the leachate pond is in accordance with the CQA Plan and Technical Specification. Following completion of installation of the HDPE geomembrane, a leak detection survey will be undertaken (see Section 5.4.4.2). Further details regarding the installation of the lining system is provided in the Technical Specification (available in Appendix B).

5.4.4.2 *Leak Detection Survey*

A leak detection survey will be undertaken on the HDPE geomembrane layer, utilising either the arc testing method or water lance method, to identify any potential holes in the geomembrane. Any anomalies detected in the underlying geomembrane will be repaired by the Contractor as directed by

the CQA consultant. Further details regarding the Leak Detection Survey are provided in the Technical Specification (available in Appendix B).

5.4.5 As-Built Drawings

During construction, an approved qualified surveyor will survey each layer of the GO Processing Area. This data will be used to prepare 'as-built' drawings which will be endorsed by the surveyor. The as-built drawings will include, but are not limited to:

- Hardstand and internal access roads
  - Spot-heights of subgrade and pavement layers sufficient to accurately determine the dimensions and thickness of each layer;
  - All stormwater infrastructure, including invert levels, pit locations and headwall locations;
  - Alignment of fencing;
  - Location and heights of any encountered or new service, utility or conduit;
  - All kerbing, footpaths and pram ramps; and
  - All traffic facilities including medians, signs and pavement markings.
- Leachate Pond
  - Formation excavation levels;
  - Top of engineered attenuation layer levels;
  - Construction details including levels and slope angles for the basal liner system;
  - Locations and identification marks of each geosynthetic panel, including anchor trenches;
  - Locations of damaged areas and penetrations; and
  - Locations of patch repairs.

5.5 Project Timeline

The current estimated timeframe for each stage is shown in Table 5-3.

Table 5-3: Project Timeline

Construction works	Timeframe
Start of construction	Winter 2025
End of construction	Winter 2025
Environmental commissioning	Spring 2025
Start of operations	Spring 2025

6 Infrastructure Operational Aspects

The following sections outline the key operational aspects of GO Processing Area and its corresponding environmental control systems.

6.1 Feedstock and Waste Acceptance

The facility is designed to accept a wide range of source-separated greenwaste/GO. Materials must meet specific size requirements, with lengths under 1.5m and diameters not exceeding 300mm. Upon arrival, clean GO are weighed at the Site weighbridge and either directed into immediate processing or stockpiled for no longer than 10 weeks.

6.2 Waste Processing

Once a sufficient volume has accumulated, the GO is shredded by a third-party contractor to a nominal size of 100mm or smaller and placed into windrows. The windrows are watered to 50%-60% water content to initiate the pasteurisation process while the entire windrow should maintain 50%-55% moisture. The temperature is monitored to ensure the entire pile reaches between 55°C and 65°C for three consecutive weeks. To ensure maintain optimum heat the windrows are aerated by two front-end loaders. Once this is achieved the size of the windrows is reduced for curing purposes. Once the internal temperature drops to less than 45°C, the product is considered stable. Depending on customer requirements, the mulch and soil improver products may be screened using a 8mm screen and blended. Final product is tested to ensure *Australian Standard 4454: Composts, soil conditioners and mulches* (AS 4454) specifications are achieved and stored in piles less than two meters in height in line with the Site Licence.

Diagram 6-1 outlines EMRC's processing flow chart of GO processing to mulch.

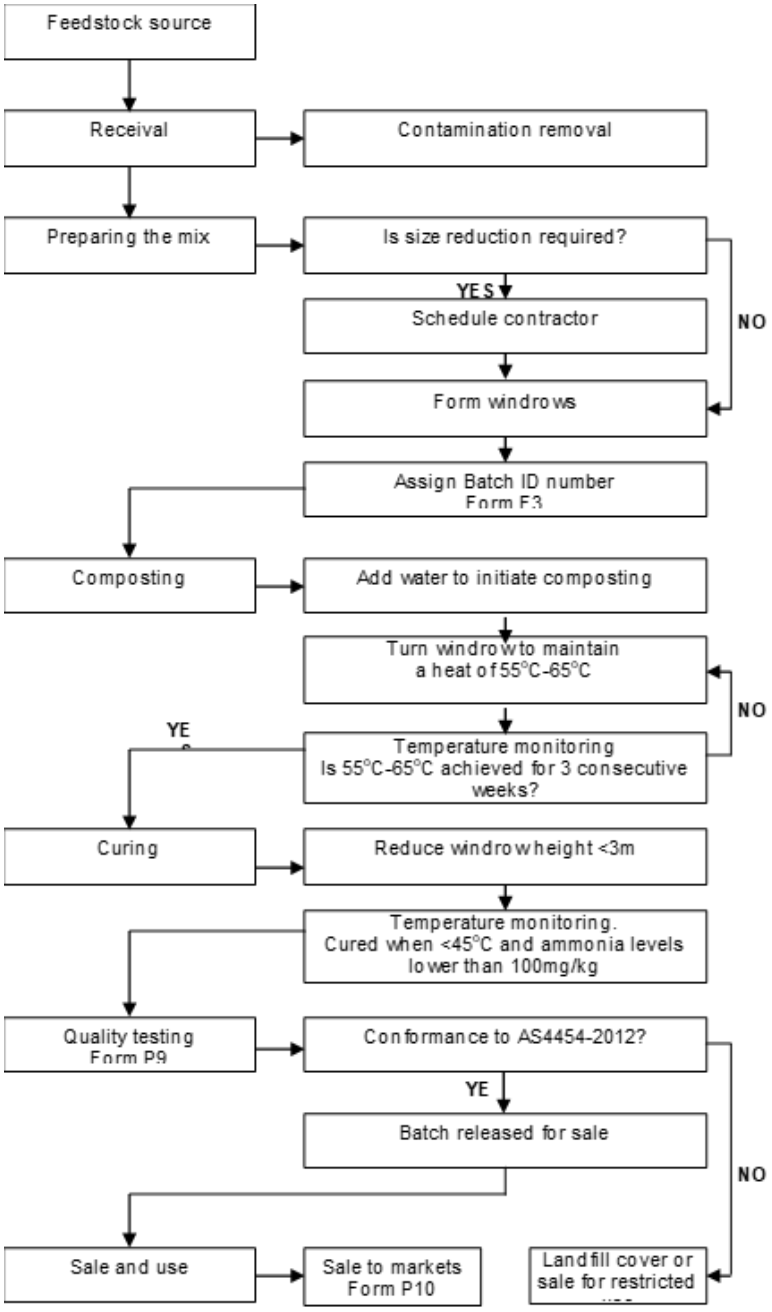

Diagram 6-1: Processing Flow Chart of GO Processing to Mulch

6.3 Operational Hours

The current operational hours for the new GO Processing Area will continue to be the same as the rest of the Site, which are as follows:

- Monday to Saturday 8:00am to 4:00pm; and
- Sunday 10:00am to 4:00pm.

The Site will be closed on New Year's Day, Christmas Day and Good Friday.

6.4 Surface Water Management

The overall surface water management for the Site consists of open channel swale networks with separate systems for stormwater, and leachate generated from GO Processing Area hardstand.

The surface water run-off from the GO Processing Area and access roads that does not come into contact with any GO material will be directed into the existing attenuation pond located to the north of the proposed development footprint via a series of drains, pits and pipework.

Regular site maintenance and repairs of drains and other associated surface water management infrastructure will also be undertaken. Site staff will inspect the system for evidence of contamination, excessive sedimentation and structural integrity of the system on a regular basis.

Water within the surface water pond system is also monitored to ensure compliance with the Site Licence and to identify any environmental issues that may impact the surrounding environment. Surface water monitoring is defined within the Site licence and will be adopted for GO Processing Area once operational.

6.5 Leachate Management

To prevent leachate stored in the new evaporation pond from percolating into the groundwater system, the pond will be lined in general accordance with Organics Guideline as outlined in Section 5.4.4.

A 0.5m freeboard will be maintained as per the Organics Guideline and Site Licence. The pond floor will be sloped towards a central, low point to allow for easier extraction of leachate, if required. EMRC is currently investigating the possibility of incorporating leachate recirculation within its GO processing; however, as a worst-case scenario, leachate recirculation has not been considered as part of the sizing of the leachate pond. The water balance for the proposed evaporation pond is outlined in Section 7.2.3.

Leachate evaporators will be installed in the leachate pond to maximise leachate evaporation rates, particularly during wet weather periods (e.g., winters). During extreme rainfall events or wet, winter periods, leachate within the leachate pond can be automatically pumped into one the Site's existing leachate ponds, L5, in the southern part of Lot 2 as a contingency to mitigate overtopping.

The pond system will be fenced to prevent unauthorised access, and as a health and safety precaution, a safety netting and life buoy will be installed on the interior face of the pond to provide an egress point. The leachate pond can be accessed via light vehicles along its entire perimeter.

The leachate pond will be regularly inspected, maintained, and repaired, when necessary, in line with current Site general maintenance and operations. Leachate level monitoring within the ponds will be undertaken on a regular basis to ensure the leachate evaporation system is operating effectively in line with the Site Licence.

7 Environmental Aspects and Management

There are a range of environmental performance objectives associated with the GO Processing Area that would require management. These aspects are currently managed at the Site through the implementation of the EMRC's Environmental Management System, environmental management procedures and internal audits.

7.1 Environmental Management System (EMS)

The Site currently operates under the Licence and in accordance with Ministerial Statement 274 (MS274) and Ministerial Statement 1140 (MS1140), which stipulates a range of environmental management conditions that must be met. To ensure compliance with these conditions and minimise environmental impacts, the EMRC maintains an extensive environment management system (EMS) framework for the Site.

The overarching EMS outlines the operational and management requirements of the facility, and the monitoring and reporting measures implemented to manage and mitigate environmental risks. The EMS has been prepared to minimise environmental impacts of Site operations through the adoption of best practice management. Environmental monitoring is conducted extensively and regularly across the Site to provide assurance that the environment is not being impacted by Site activities and to provide sufficient warning in the event environmental protection systems are compromised.

The EMS also prescribes the requirements for undertaking environmental monitoring and this is administered under the EMS through the implementation of several environmental monitoring and sampling programs for groundwater, surface water, leachate, landfill gas, dust, odour and noise. Results from these monitoring programs and other management measures are reported annually to the DWER pursuant to Condition 40 of the Licence.

The EMS is a 'live' document that is updated as the Site progresses. Following obtainment of the relevant approvals, any relevant conditions will be carried across to the EMS by EMRC. Therefore, it will be applied to the relocated GO Processing Area.

7.2 Environmental Aspects

The potential for the relocated GO Processing Area to impact on a number of key environmental and social aspects is recognised. The potential impacts and management controls associated with each key aspect are discussed in the following subsections, namely:

- Feedstocks and Product Quality;
- Surface water;
- Leachate
- Groundwater;
- Air emissions, including:
  - Odour;
  - Dust;
  - Noise;
- Litter;
- Vermin and Feral Animals;
- Weeds;
- Dieback;
- Fire; and
- Security.

7.2.1 Feedstocks and Product Quality

As stated in Section 8.1 of the Organics Guideline, while feedstocks used for organics recycling need to have a beneficial outcome for product quality, contaminants in feedstocks must be treated effectively and recycled organic products must be fit-for-purpose. To ensure feedstocks and the products produced at the Site meet the desired quality, the EMRC employs the *Red Hill Composting Facility Quality Control System* (EMRC, 2009, last reviewed 2024). The EMRC obtained AS4454 certification for mulching and composting activities in October 2009 and maintains this certification through its EMS as discussed in Section 7.1.

The GO material accepted at the Site is typically processed into either a mulch or soil conditioner. The characteristics of each product are outlined in Table 7-1.

Table 7-1: Summary of Processed GO Products

Product	Description	Use	Characteristics
EMRC Mulch	Mulched garden organics from Council verge collections, transfer station drop-offs, and government and commercial landscaping activities.	Places a protective cover over soil to control temperature, suppress weeds and improve water retention.	• Coarse 20-70% will be retained in a 16mm sieve for 'Fine Mulch', • Otherwise >70% for 'Course Mulch' • Shredded prior to pasteurisation
EMRC Soil Conditioner	Composted FOGO and Garden Organics from Participant councils residential FOGO and garden organics MGB.	Enhances the condition of the soil to improve plant growth.	• Soil Conditioner • <20% will be retained in 16mm sieve • Screened after composting to remove litter and residual glass and plastics contaminants

The final mulch product is tested at a minimum rate of one composite sample per 5,000 tonnes of product as per the Organics Guideline to ensure it meets these characteristics as listed in Table 7-1.

7.2.2 Surface water

As stated within Section 8.2 of the Organics Guideline, stormwater must be diverted from feedstocks, materials undergoing processing, residual physical contaminants or products and leachate ponds into dedicated surface water management infrastructure. Therefore, to manage surface water outside the GO Processing Area, particularly from perimeter access roads, a series of drains will be installed as required and will direct water to an existing attenuation pond north of the development footprint.

Christmas Tree Creek (south of the Site), Susannah Brook (north of the Site) and Strelley Brook (west of the Site) are the main receiving environments in the event surface water ponds overflow during storm events. Surface water is monitored at fifteen locations on and off the Site on a seasonal basis to identify any impact from activities from the Site. All results collected during these monitoring events is submitted annually in the EMRC's Environmental Monitoring & Compliance Report pursuant to the Site Licence.

Any surface water that interacts within the GO Processing Area's hardstand will be classified as leachate and would be collected via the leachate collection system prior to evaporation by a dedicated leachate pond, which is discussed further in Section 7.2.3.

7.2.3 Leachate

As detailed in Section 6.5, leachate will be collected and diverted to a dedicated leachate pond north of the hardstand for the GO Processing Area. The pond has been appropriately sized in line with the Organics Guidelines; however, as a contingency leachate can be pumped from a sump in the pond and transferred via pipework to the existing L5 leachate pond located in Lot 2. The following subsections provide a summary of the required water balance assessment for the newly proposed leachate pond in the GO Processing Area.

7.2.3.1 *Leachate Generation Modelling*

The Organics Guideline states that any leachate storage infrastructure must have sufficient capacity to contain the runoff from a 1-in-20 year, 24 hour storm event (108mm of rainfall as per Table 4-2), assuming a runoff coefficient of 1, at a minimum. The design needs to be supported by a month-to-month water balance that considered a wet, 90th percentile rainfall year.

To determine the potential generation of leachate within the GO Processing Area, and therefore the leachate input for the pond, Talis undertook modelling using climate data from SILO. Based on a hardstand area of 21,232m^2, the volume of leachate generated in a given month during a 50th and 90th percentile rainfall years are summarised in Table 7-2.

Table 7-2: Summary of Leachate Generation in m^3 – Including Potential Future Expansion

Scenario	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
90th Percentile	0	519	283	887	5,268	6,012	5,059	5,073	2,229	1,444	1,123	159	28,054
50th Percentile	33	409	373	299	1,732	5,394	4,557	4,930	3,687	324	1,405	0	23,143

The details and justification of the data selection for the water balance model are discussed in the following sub-sections.

7.2.3.2 *Water Balance Assessment*

A Water Balance Assessment was utilised to determine the appropriate size of the proposed leachate evaporation pond and to assess its subsequent performance. Using a Microsoft Excel algorithm, the assessment presented a simplified input and output system based on the following:

- Inputs:
  - Leachate inflow
  - Monthly rainfall
- Outputs:
  - Evaporation

System Inputs

The leachate generation volumes presented in Table 7-2 were utilised as part of the Water Balance Assessment for the pond as well as the monthly rainfall for 50th and 90th percentile rainfall years. The 50th and 90th percentile rainfall scenarios equate to an annual rainfall of 845mm and 1,022mm, respectively.

System Outputs

To quantify the amount of leachate evaporated each year, the following parameters were assumed:

- The freeboard was set at 500mm to determine the operational volume of the pond;
- The actual evaporation rate was assumed to be 70% of the potential pan evaporation rate;
- No leachate is recirculated within the GO processing operations;
- No rainfall within the catchment areas for both the evaporation pond and hardstand was lost to run-off; and
- For the purpose of the calculations, the evaporation area was set at half the pond depth.

Evaporation maximisation methods, such as the mechanical evaporator and the smaller floating aerators have not been assumed as part of the Water Balance Assessment, as a conservative measure.

The volumes within the evaporation pond, for a given month, included the initial leachate inputs transferred from the hardstand area, the remaining leachate from the previous month (if any), and the rainfall within the pond's catchment area based on the rainfall scenario.

Details on the system outputs are provided in Appendix E.

Assessment Results

The water balance model was then run under a 90th percentile rainfall year followed by a 50th percentile rainfall year as an additional contingency above the required scenario outlined in the Organics Guideline.

The modelling demonstrates that the proposed evaporation pond with additional pumping to L5 during the winter periods is able to manage all leachate generated throughout this 2-year period without year-on-year increases, assuming the evaporation rates for both 50th and 90th percentile rainfall years. The modelling demonstrates that the pond is able to quickly recover from a wet rainfall year, returning pond volumes to low, manageable levels in average or drier conditions.

Detailed modelling results are shown in Appendix E.

Storm Event Check

The Organics Guideline state that a leachate pond must have a freeboard that can accept rainfall directly on the pond from a 24-hour rainfall event with a 1-in-20-year average recurrence interval without overflowing. This has been referred to as a storm event check within the Water Balance Assessment. The storm event will be utilised within the water balance model to check whether the cumulative residual volume in each pond has sufficient capacity to accept the storm event, in addition to normal rainfall and leachate inputs for any given month, while still operating below the freeboard level.

The AEP corresponding to a 24-hour, 1-in-20 year storm event was 108mm as indicated in Table 4-2. The water balance model verified that the pond system has adequate capacity to cater for a 1-in-20-year, 24-hour storm event over and above the normal system inputs for the continuous average rainfall year. The proposed pond can also manage a 90th percentile rainfall year scenario and have the capacity to cater for the designed storm event with assistance from L5 during the winter months. In addition to accommodating for wave action, the 500mm freeboard provides an additional measure to mitigate the risk of overtopping during a significant rainfall event while a pond is close to its operational capacity.

The results of the Water Balance Assessment with the storm event check are provided in Appendix E.

7.2.4 Groundwater

As detailed in Section 5, the relocated GO Processing Area has been designed to protect the surrounding environment and groundwater from impacts caused by leachate that is in line with the Organics Guideline requirements.

Groundwater monitoring of the Site's existing network will continue to be undertaken to ensure that in the event the integrity of the lining system is comprised, contamination can be detected early. Groundwater is monitored on a biannual basis and results are reported as required by Condition 40 of the Site Licence. Groundwater monitoring is undertaken in accordance with EMRC's Water Monitoring Procedure. Throughout the lifespan of the Site, groundwater will continue to be monitored at all bore locations in the network.

There are no monitoring bores within the GO Processing Area development footprint. There are several existing monitoring bores located up- and down-hydraulic gradient of the relocated GO Processing Area. All of these bores will continue to be monitored as per Licence conditions to highlight any potential impacts to groundwater from the GO processing activities. No new monitoring bores are proposed at this time.

In the event that an exceedance or declining groundwater quality trend is identified, further monitoring and investigation will be undertaken. Previous records of elevated analysis results have typically been indicative of a seasonal or short-term occurrence and have not generally continued over a long period of time. This is typical of a highly seasonal and variable groundwater system.

7.2.5 Odour

Odours at the Site are generated from a range of sources including the acceptance/transport of putrescible waste, composting/pasteurisation activities, leachate evaporation ponds and exposed waste prior to the application of cover material.

The Organics Guideline defines the following main sources of odour emissions from organics recycling activities that are relevant to the relocated GO Processing Area:

- Feedstock acceptance and handling: some feedstocks may be highly odorous at acceptance because of anaerobic conditions in bins/trucks before collection and during transport;
- Storage of feedstock and product: some feedstock types can generate odour emissions if stored inappropriately or for extended periods;
- Windrows: if not appropriately managed (i.e. through turning or forced aeration), windrows may become anaerobic – causing an increase in odour emissions. Windrows may also become anaerobic from over-wetting or from excessive liquid feedstocks being added;
- Storage and use of outputs from the organics recycling process;
- Leachate containment systems: nutrient-rich leachate has the potential to generate odours, particularly when the leachate becomes anaerobic. Leachate from the early composting/ pasteurisation phase is most likely to generate odours; and
- Leachate pond desludging.

To mitigate odours from the GO processing there are a range of management measures currently employed, including:

- Consideration of meteorological conditions during material handling;

- Regular maintenance and monitoring of the leachate treatment system;
- Regular monitoring of the GO stockpiles and processing windrows;
- Covering of waste during transport; and
- A complaints register will be maintained and, in the event that a complaint is received, EMRC will investigate the source and implement appropriate management controls.

These management measures will continue to be applied during the operations of the relocated GO Processing Area and is considered to be sufficient to adequately mitigate and manage potential odour impacts.

7.2.5.1 *Screening Analysis*

During the pre-scoping meeting for the project, the DWER indicated that a screening analysis as outlined in the Odour Guideline should be undertaken to confirm that a detailed odour assessment is not required for the project.

The location earmarked for the relocated GO Processing Area is currently not included in the prescribed premises Site boundary; however, the area still part of the overall Site and has been since its purchase in 2012 with EMRC undertaking bulk earthworks to develop a working platform for future activities in 2020. Therefore, the screening analysis for an existing premises has been considered for this desktop assessment as opposed to a new premises.

Q1. Description of odour emissions

The high fibrous and lower nutrient composition of GO minimises odour generation, reducing the likelihood of any noticeable contribution to the local odour profile.

The GO processing operations are currently active at the Site, so the activities and potential odour emissions sources are not new to the premises. The potential odour emissions from the Site's GO processing operations are considered negligible compared to existing odour sources in the vicinity, including from putrescible landfill and FOGO processing operations.

The following are sources for odour emissions and proposed controls:

- Storage of feedstock and product (not significant due to the above);
- Windrows:
  - Periodic turning of windrows preventing anaerobic conditions and subsequent odour development; and
  - Preventing excessive watering of windrows by limiting water application and keeping moisture levels at 50% to 60%.
- Leachate containment:
  - Regular maintenance and monitoring of the leachate treatment system;
- Odour complaint system and follow-up investigations/actions.

Q2. Identification of current odour impacts:

EMRC has not received any complaints or community feedback related to GO operations, as outlined in EMRC's annual environmental reports that are submitted to the DWER. Therefore, odour diaries and field odour assessments have also not been required or deemed necessary.

Q3. Changes to emissions

There are no proposed changes to the existing premises that are likely to increase the odour emissions, or change the configuration of any source in the GO Processing Area as outlined in the following:

- No changes to the throughput or infrastructure of the GO processing operations compared to the previous location;
- The Site's GO processing operations have a licenced maximum throughput of 28,000tpa. It is recognised that the Odour Guideline states a minimum screening distance of 2,500m for operations under Category 67A between 20,000tpa to 35,000tpa. However, EMRC is proposing to relocate GO operations situated further away from sensitive receptors, potentially mitigating part of the previous odour impact;
- As outlined in Section 4.1.1, prevailing winds point into east to northeast in the morning and southwest in the afternoon while the closest sensitive receptors are located in the southeast.

In keeping with the screening analysis worksheet for existing premises, the desktop assessment was concluded. The completed questionnaire has been provided in Appendix D.

Summary

Therefore, in accordance with the Odour Guideline, since emissions are not likely to increase and the proposed project achieves better environmental outcomes then current operations, a detailed odour analysis is deemed to not be required.

7.2.6 Dust

Dust will be generated during the construction and operation phase of the GO Processing Area as a result of earthworks and handling of materials. Excessive dust generation can impact local air quality causing respiratory impacts and reduced vision. To manage dust generation, the EMRC currently implement a range of measures including:

- Vehicles to maintain minimum speed limits;
- Use of a water cart as necessary;
- Consideration of meteorological conditions during material handling;
- Covering of waste during transport; and
- Appropriate handling and unloading of waste to minimise dust generation.

These measures will continue to be implemented during the construction and operation of the relocated GO Processing Area and are deemed to adequately mitigate and manage potential dust impacts.

7.2.7 Noise

Noise will be generated during the construction and operation phase of the GO Processing Area as a result of vehicle and machinery activities. To reduce noise impacts, the EMRC currently implements a range of management measures, including but not limited to broadband reversing alarms, restricted operating hours, regular maintenance and Personal Protective Equipment (PPE).

All mobile machinery currently has broadband reversing alarms installed which generate noise across a range of frequencies. A directional beam of noise is generated which quickly blends in with

background noise minimising the noise disturbance. To further minimise noise impacts, particularly to surrounding land users or sensitive receptors, operational hours are limited to 7am to 4pm Monday to Friday, 8am to 4pm on Saturday and 10am to 4pm Sunday. To protect the hearing of onsite personnel, PPE is worn when they are near equipment or machinery (as required). Regular maintenance is undertaken to ensure mobile machinery and equipment are operating efficiently.

These management measures will continue to be applied during the operations of the relocated GO Processing Area and are considered to be sufficient to adequately mitigate and manage potential noise impacts.

7.2.8 Litter

Litter may be generated during the transport and handling of waste, causing impacts to amenity. To minimise the impacts from litter, the following management measure are currently implemented onsite:

- Maintenance of Site perimeter fencing 1.8m high;
- Covering of waste during transport; and
- Daily removal of windblown waste from fences and access roads.

These management measures will continue to be applied during the operations of the relocated GO Processing Area and are deemed to be sufficient to adequately mitigate and manage potential litter impacts.

7.2.9 Vermin and Feral Animals

Due to the types of waste accepted, water sources and surrounding bushland, feral animals and vermin such as cats, foxes, rabbits, mice and rats have the potential to be attracted to the Site. Management of feral animals and vermin is currently undertaken through a biannual control program involving trapping, baiting and remote sensor camera imaging targeting such species as cats, foxes, rabbits, and mice. This program is implemented through EMRC's Feral Animal Management Procedure under its EMS and is administered by a licensed animal pest control contractor. These management measures for vermin and feral animals will continue to be implemented for the relocated GO Processing Area and are considered to be sufficient to adequately mitigate and manage potential vermin and feral animal impacts.

7.2.10 Weeds

Weed species have been recorded in cleared or disturbed areas within the Site. The EMRC currently implement a range of management measures to ensure that weed populations do not spread and compromise the integrity of surrounding native vegetation and the native rehabilitation program on capped landfill cells. Routine inspections are conducted each season and control measures (herbicides and physical removal) are undertaken several times per year as required and prior to flowering periods.

These management measures will continue to be applied during the operations of the relocated GO Processing Area and are deemed to be sufficient to adequately mitigate and manage potential weed impacts.

7.2.11 Dieback

As the Site is located within a dieback infested area, the EMRC currently implements a range of environmental controls to mitigate the spread of dieback offsite. The management measures include a wheel washdown facility located near the main Site entrance, rehabilitation, drainage management, retention of bushland buffers and minimising disturbance. To manage impacts to rehabilitated areas onsite several local, non-susceptible native species are used.

These management measures will continue to be applied during the operations of the relocated GO Processing Area and are considered to be sufficient to adequately mitigate and manage potential dieback impacts.

7.2.12 Fire

There are a variety of fuel sources for fires at the Site, including waste in the active landfill areas, flammable liquid storage units, landfill gas extraction operations, machinery, mulch and GO stockpiles. Therefore, the EMRC have developed an Emergency Preparedness and Response Plan to outline the strategies to prevent fires and actions to control fires, should they occur. The Site is well equipped to control small fires, and most employees are suitably trained in fire control techniques. The Site's location also enables a fast response time for the local Volunteer Bushfire Brigade and City of Swan Rangers. The infrastructure available to respond to fires onsite includes fire extinguishers, stormwater attenuation ponds, 30,000L mobile water tank and fire breaks. As stipulated in Condition 17 of the Site Licence, an adequate water supply should be provided to extinguish a fire at any part of the Site. Pursuant to Condition 18 of the Site Licence, the EMRC must advise the DWER of any fires that occur onsite within two hours of the fire being discovered.

These management measures will continue to be applied during the operations of the relocated GO Processing Area and are deemed to be sufficient to adequately mitigate and manage potential fire impacts.

7.2.13 Security

A breach of security may result in injury to persons or damage to infrastructure. To minimise potential security the following management measures are implemented:

- Appropriate signage is installed at the site entrance;
- Lighting and CCTV is installed in relevant areas of the Site including at the main Site access road and key buildings;
- A perimeter fence is installed around the Site and is monitored and maintained on a regular basis; and
- All access gates and buildings are locked securely outside of operational hours.

These management measures will continue to be applied during the operations of the relocated GO Processing Area and are deemed to be sufficient to adequately mitigate and manage potential security risks.

7.3 Environmental Management Summary

A summary of the environmental management measures is provided in Table 7-3.

Table 7-3: Summary of Environmental Management Measures

Aspects	Management Measures
Feedstocks and Product Quality	• EMRC employs the Red Hill Composting Facility Quality Control System which has attained AS4454 certification • Monitoring of initial feedstock, processing windrows and final end product to remove physical contaminants • The final mulch product is tested at a minimum rate of one composite sample per 5,000 tonnes of product as per the Organics Guideline
Surface Water	• Implementation of a surface water management system, consisting of a series of drains will be installed as required that will direct water to an existing attenuation pond north of the development footprint • Ongoing surface water monitoring and reporting
Leachate	• Leachate collection system within the hardstand area, designed using the criteria within the Organics Guideline, including: o Low-permeability compacted surfacing initially and will be progressively sealed o Nominal 2% base slope • Dedicated leachate evaporation pond that is lined with a geosynthetic lining system and connected to the Site's overall leachate evaporation pond system as a contingency • Ongoing groundwater monitoring in accordance with the Site's Water Monitoring Procedure and Site Licence
Groundwater	• Dedicated leachate evaporation pond that is lined geosynthetic lining system designed using the criteria within the Organics Guideline • Low-permeability compacted hardstand, which will be progressively sealed, designed using the criteria within the Organics Guideline • Minimum separation distance of 3m from known groundwater table levels • Ongoing biannual monitoring in accordance with the EMRC's Water Monitoring Procedure and Site Licence • Reporting in accordance with Condition 40 of the Site Licence
Odour	• Consideration of meteorological conditions during material handling • Regular monitoring of the GO stockpiles and processing windrows • Regular maintenance and monitoring of the leachate treatment system • Covering of waste during transport • Odour complaint system and following up investigations/actions
Dust	• Consideration of meteorological conditions during material handling • Vehicles to maintain minimum speed limits • Use of a water cart as necessary • Covering of waste during transport • Appropriate handling and unloading of waste to minimise dust generation
Noise	• Broadband reversing alarms • Restricted operating hours • Regular maintenance of mobile machinery and equipment • Use of appropriate PPE

Litter	• Maintenance of the Site perimeter fencing 1.8m high • Daily removal of windblown waste from fences and access roads • Covering of waste during transport
Vermin & Feral Animals	• Biannual pest control program completed by a licensed animal pest control contractor • Implementation of the EMS's feral animal management procedure
Weeds	• Regular inspection once operations being • Physical and chemical removal as needed
Dieback	• Wheel washdown facility • Minimising disturbance • Rehabilitation of landfill cap with local native species, several of which not susceptible to dieback
Fire	• Implementation of the Site's Emergency Preparedness and Response Plan • Fire response infrastructure and equipment, including 30,000L mobile water cart. fire extinguishers, stormwater dams, and fire breaks • Staff trained in fire response techniques
Security	• Appropriate signage is installed at the site entrance • Lighting and CCTV is installed in relevant areas of the Site including at the main Site access road and key buildings • A perimeter fence is installed around the Site and is monitored and maintained on a regular basis • All access gates and buildings are locked securely outside of operational hours

8 Residual Risk Assessment

Each of the potential risks was assessed as per the *DWER Guidance Statement: Risk Assessments - Part V, Division 3, Environmental Protection Act 1986* (February 2017) (Guidance Statement). The objective of the Residual Risk Assessment is to ensure the potential risks associated with the proposed activities are understood and managed appropriately to ensure that there is no unacceptable residual risk. The sources of hazards, pathways and receptors of hazards identified are outlined in the following subsections.

8.1 Sources of Hazards

For the purpose of this assessment, a source is defined as a primary risk with the potential to cause significant contamination or harm to the environment. With regards to the environment and public health, sources and its potential hazards which may arise from the various future activities have been identified and are shown in Table 8-1.

Table 8-1: List of Potential Hazards

Source	Description of Hazards
Feedstock & Product Quality	Impurities in feedstocks can reduce the quality of the end product, which can become a source of contamination if reused
Surface Water	Excessive surface water that is not properly managed can lead to flooding onsite Surface water that comes into contact with waste can generate leachate
Leachate	Risk to surface and groundwater from the seepage of leachate from the facility
Odour	Odours generated from putrescible waste can cause impacts to amenity
Dust	Dust generated during construction works can result in reduced visual amenity and cause respiratory issues
Noise	Noise emissions can cause impacts to amenity
Litter	Litter can result in impacts to amenity on and immediately surrounding the Site
Vermin & Feral Animals	Exposed waste can attract vermin which may cause nuisance and present health risks
Weeds	Introduction and spread of weeds can comprise revegetation
Dieback	Spread of dieback offsite and its impacts to rehabilitated areas
Fire	Potential for fires from waste materials and equipment
Security	Unauthorised personnel may access the Site resulting in a security breach of the Site facilities, plant and equipment

8.2 Pathways for Hazards

For the purpose of this assessment, a pathway for a hazard is defined as the route by which potential contamination or harm can migrate. The key migration pathways at a waste management facility generally include the following:

- Air through which lightweight materials/emissions, such as dust, litter, and odour, can travel;
- Surface along which the sources of contamination or harm can travel or be present at (e.g., surface water runoff, litter, persons walking or working over the surface); and
- Sub-surface whereby the underlying soils, bedrock, aquifers and infrastructure permit leachate migration towards the receptors.

For the purpose of this assessment, a receptor is defined as the location where the impact of the contamination or harm is registered. The possible receptors of the contamination or harm cause by the identified hazards are summarised in Table 8-2.

Table 8-2: Receptors

Receptor	Description of the Receptor
Atmosphere	• Ozone layer surrounding the Earth
Air Quality	• Local air quality
Site Users	• Persons authorised to traverse across the Site including: o Operational staff o Contractors carrying out maintenance or monitoring o Visitors/Customers
Site Infrastructure	• Buildings onsite and associated infrastructure
Surrounding Land Users	• People who work or live beyond the boundary of the facility
Surface Water	• Surrounding natural surface water bodies
Groundwater	• Groundwater that exists beneath the facility either as a local perched system or as a regional aquifer from which a water supply may be extracted for industrial or potable purposes
Vegetation and Flora	• Vegetation and flora in surrounding areas
Fauna	• Fauna species whose habitat is within or surrounding the facility

8.3 Risk Rating Matrix

To assess the various risks, the potential hazards identified in Table 8-1 were classified according to the DWER's Guidance Statement shown in Table 8-3.

Table 8-3: Risk Rating Matrix

		Consequence				
		Slight	Minor	Moderate	Major	Severe
Probability	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

8.4 Risk Profile

Risk management measures refers to the key management strategies that will be adopted onsite to ensure that all hazards and potential risks identified are controlled to an appropriate level, and that strategies are in place to react to any potential incidents or accidents. In most cases these risk management measures decrease the probability and/or consequence of identified hazards and therefore lower the risk rating. The current risk rating and revised probability and consequence for each identified hazard following the implementation of management measures for the proposed project are shown in Table 8-4.

Table 8-4: Residual Risk Profile for the Proposed Project

Source	Receptor	Pathway	Risk	Probability	Consequence	Risk Rating	Management Measures	Revised Probability	Revised Consequence	Revised Risk Rating
Feedstock & Product Quality	Vegetation and flora	Surface	Impurities in feedstock and end product can become a source of contamination to vegetation and flora as well as surrounding surface water	Possible	Major	High	• EMRC employs the Red Hill Composting Facility Quality Control System which has attained AS4454 certification • Monitoring of initial feedstock, processing windrows and final end product to remove physical contaminants • The final mulch product is tested at a minimum rate of one composite sample per 5,000 tonnes of product as per the Organics Guideline	Unlikely	Slight	Low
	Surface water	Surface		Possible	Major	High		Unlikely	Slight	Low
	Fauna	Surface	Impurities in feedstock and end product can be harmful to fauna if ingested	Possible	Major	High		Unlikely	Slight	Low
Surface Water	Vegetation and flora	Surface	Sedimentation from uncontrolled stormwater impacting flora and vegetation	Possible	Minor	Medium	• Implementation of a surface water management system, consisting of a series of drains will be installed as required that will direct water to an existing attenuation pond north of the development footprint • Ongoing surface water monitoring and reporting	Unlikely	Slight	Low
	Groundwater	Surface	Water that encounters waste generating leachate that can cause contamination to groundwater	Possible	Major	High		Unlikely	Slight	Low
	Surface water	Surface	Uncontrolled stormwater that encounters waste generating leachate and contaminating surrounding surface water	Possible	Major	High		Unlikely	Slight	Low
Leachate	Groundwater	Subsurface	Contamination of groundwater resulting from seepage from the facility	Possible	Major	High	• Leachate collection system within the hardstand area, designed using the criteria within the Organics Guideline, including: o Low-permeability compacted surfacing initially and will be progressively sealed o Nominal 2% base slope • Dedicated leachate evaporation pond that is lined with a geosynthetic lining system and connected to the Site's overall leachate evaporation pond system as a contingency • Ongoing groundwater monitoring in accordance with the Site's Water Monitoring Procedure and Site Licence	Unlikely	Minor	Medium
Odour	Site Users	Air	Odours generated from the acceptance and degradation of waste in the facility impacting amenity onsite	Almost certain	Minor	High	• Consideration of meteorological conditions during material handling • Regular monitoring of the GO stockpiles and processing windrows • Regular maintenance and monitoring of the leachate treatment system • Covering of waste during transport • Odour complaint system and following up investigations/actions	Possible	Slight	Low
	Surrounding Land Users	Air	Odours generated from the acceptance and degradation of waste at the facility impacting nearby receptors	Possible	Minor	Medium		Unlikely	Slight	Low
Dust	Site Users	Air	Visibility may be impaired, and inhalation of dust may occur during construction activities and handling of waste materials	Possible	Minor	Medium	• Consideration of meteorological conditions during material handling • Vehicles to maintain minimum speed limits • Use of a water cart as necessary • Covering of waste during transport • Appropriate handling and unloading of waste to minimise dust generation	Possible	Slight	Low
Noise	Site Users	Air	Noise impacts from activities onsite impacting Site users	Likely	Slight	Medium	• Broadband reversing alarms • Restricted operating hours	Unlikely	Slight	Low

	Surrounding Land Users	Air	Noise impacts from activities onsite impacting nearby receptors	Possible	Slight	Low	• Regular maintenance of mobile machinery and equipment • Use of appropriate PPE	Unlikely	Slight	Low
Litter	Site Users	Air and surface	Litter impacting on amenity onsite	Possible	Slight	Low	• Maintenance of the Site perimeter fencing 1.8m high • Daily removal of windblown waste from fences and access roads • Covering of waste during transport	Rare	Slight	Low
	Surrounding Land Users	Air and surface	Litter impacting amenity of nearby receptors	Unlikely	Slight	Low		Rare	Slight	Low
Vermin & Feral Animals	Site Users	Surface	Putrescible waste can attract vermin and feral animals presenting health risks, reduced amenity and nuisance	Possible	Minor	Medium	• Biannual pest control program completed by a licensed animal pest control contractor • Implementation of the EMS's feral animal management procedure	Possible	Slight	Low
Weeds	Vegetation and flora	Air and Surface	Introduction of weeds impacting surrounding native vegetation or revegetation onsite	Possible	Minor	Medium	• Regular inspection once operations begin • Physical and chemical removal as needed	Unlikely	Slight	Low
Dieback	Vegetation and flora	Surface	Spread of dieback offsite and impacts to rehabilitation	Possible	Minor	Medium	• Wheel washdown facility • Minimising disturbance • Rehabilitation of landfill cap with local native species, several of which not susceptible to dieback	Possible	Slight	Low
Fire	Site Users	Surface	Risk of fires onsite from equipment or waste management activities creating risk to personnel and infrastructure	Unlikely	Severe	High	• Implementation of the Site's Emergency Preparedness and Response Plan • Fire response infrastructure and equipment, including 30,000L mobile water cart. fire extinguishers, stormwater dams, and fire breaks • Staff trained in fire response techniques	Rare	Minor	Low
	Site Infrastructure	Surface		Unlikely	Major	Medium		Rare	Minor	Low
Security	Site Infrastructure	Surface	Unauthorised personnel may access the site resulting in a security breach of the site facilities, plant and equipment	Unlikely	Minor	Medium	• Appropriate signage is installed at the site entrance • Lighting and CCTV is installed in relevant areas of the Site including at the main Site access road and key buildings • A perimeter fence is installed around the Site and is monitored and maintained on a regular basis • All access gates and buildings are locked securely outside of operational hours	Unlikely	Slight	Low

8.5 Assessment Conclusion

The Residual Risk Assessment identified the current sources of hazards as well as possible sources of hazards arising from the proposed works. The risk rating prior to the implementation of management measures ranged from 'Low' to 'High'. The revised risk ratings were all downgraded to 'Low' to 'Medium' once management measures were applied. Given the proposed management measures the EMRC will ensure any potential health, environment, and amenity impacts are avoided or minimised.

9 Conclusion

The relocation of the GO Processing Area is required to allow for the continuation of this critical waste management activity while also providing long-term security for disposal of Class III waste at the Site. The relocated GO Processing Area been designed using the criteria within the Organics Guideline and will be constructed to this guideline to minimise environmental impacts. To further reduce potential environmental impacts associated with the operation of the GO Processing Area, the EMRC will continue to implement its EMS and environmental management procedures. As determined through the Residual Risk Assessment in Section 8, the residual risk rating was determined to be 'low' to 'medium' following the implementation of management measures. Therefore, the EMRC believes that the construction and operation of the relocated GO Processing Area can be adequately managed in accordance with the existing Site Licence and MS274, which will be extended following EPA Assessment.

Figures

APPENDIX A
Drawings

APPENDIX B
Technical Specification

APPENDIX C
CQA Plan

APPENDIX D

Odour Desktop Screening Analysis

APPENDIX E

Water Balance Assessment

APPENDIX F

Lots 8, 9 and 10 Earthworks Validation Report

Assets | Engineering | Environment | Noise | Spatial | Waste

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