Operational and Environmental Management Plan

Pilbara Regional Waste Management Facility

Prepared for Shire of Ashburton

January 2019

Project Number: TW18004
Revisions to the OEMP

This Operational and Environmental Management Plan (OEMP) will remain dynamic in nature and will be revised to reflect key changes arising from a variety of events including but not limited to:

- Annual management reviews
- Alterations to site infrastructure and operations
- Licence amendments
- Identification of improvements to operational and environmental management and monitoring measures.

All revisions to the OEMP are to the approved by the Shire’s Waste Services Manager.

Any changes to operational procedures, monitoring or sampling shall be communicated to all site personnel.

This current version of the OEMP has been prepared to assist with the Environmental Approval Application process. This document will be updated following the approval processes to accurately reflect the relevant regulatory requirements for the facility.

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
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</tr>
</tbody>
</table>


# Table of Contents

1 **Introduction** .................................................................................................................. 0  
   1.1 Objective of the OEMP ................................................................................................. 0  
   1.2 Continual Improvement ................................................................................................. 0  
      1.2.1 Risk Assessments ................................................................................................. 1  
   1.3 PRWMF Overview ....................................................................................................... 1  

2 **Legislative and Best Practice Guidance** ........................................................................ 2  
   2.1 Legislation .................................................................................................................. 2  
   2.2 Licence ....................................................................................................................... 2  
   2.3 Best Practice Guidance Documents ........................................................................... 3  

3 **Environmental Attributes** ............................................................................................ 4  
   3.1 Climate ....................................................................................................................... 4  
      3.1.1 Wind Direction ....................................................................................................... 4  
   3.2 Topography ................................................................................................................ 5  
   3.3 Geology ....................................................................................................................... 5  
   3.4 Groundwater ............................................................................................................... 6  
   3.5 Hydrogeology ............................................................................................................. 6  
   3.6 Flora and Vegetation ................................................................................................... 6  
   3.7 Introduced Flora .......................................................................................................... 7  
   3.8 Fauna ........................................................................................................................ 7  
   3.9 Conservation Reserve ................................................................................................. 7  

4 **Operational Aspects** ....................................................................................................... 8  
   4.1 Operator ....................................................................................................................... 8  
   4.2 Operating hours .......................................................................................................... 8  
   4.3 Staff Structure ............................................................................................................ 8  
   4.4 Visitors and Contractors ............................................................................................ 9
4.5  Machinery and Equipment .................................................................................. 9
4.6  Signage .............................................................................................................. 10
4.7  Site Inductions ................................................................................................. 10
4.8  Job Safety Analysis ........................................................................................... 10
4.9  Personal Protective Equipment ......................................................................... 11

5  Weighbridge Procedure and Waste Acceptance .................................................. 12

5.1  Weighbridge Procedure .................................................................................... 12
5.2  Waste Types Accepted ....................................................................................... 13
5.3  Controlled Waste Acceptance ........................................................................... 14
    5.3.1  Liquid wastes ............................................................................................... 15
    5.3.2  Tyres ............................................................................................................ 16
    5.3.3  Type 1 Special Wastes (Asbestos) ............................................................... 16
    5.3.4  Type 2 Special Wastes (Clinical Waste) ..................................................... 17
    5.3.5  Contaminated Solid Wastes ........................................................................ 18
    5.3.6  Neutralised Acid Sulphate Soils .................................................................. 18
5.4  Construction and Demolition Waste Acceptance ............................................. 19
5.5  Prohibited Wastes ............................................................................................. 19

6  Green Waste Processing Area .............................................................................. 20

6.1  Operational Management ................................................................................... 20
    6.1.1  Unloading .................................................................................................... 20
    6.1.2  Stockpiling .................................................................................................. 20
    6.1.3  Processing .................................................................................................... 20
    6.1.4  Recycled Product ......................................................................................... 20
6.2  Environmental Engineering Controls .................................................................. 20
6.3  Environmental Management ............................................................................. 21

7  C&D Recycling Facility ....................................................................................... 23

7.1  Operational Management ................................................................................... 23
7.2 Unloading ........................................................................................................................................... 23
7.3 Stockpiling ........................................................................................................................................... 23
7.4 Processing ............................................................................................................................................... 23
7.5 Recycled Building Products ................................................................................................................... 23
7.6 Environmental Engineering Controls ..................................................................................................... 24
7.7 Environmental Management .................................................................................................................. 24

8 Scrap Metal Stockpiling Area ..................................................................................................................... 26
  8.1 Operational Management ......................................................................................................................... 26
    8.1.1 Stockpiling ......................................................................................................................................... 26
    8.1.2 Material Processing ............................................................................................................................ 26
  8.2 Environmental Engineering Controls ....................................................................................................... 26
  8.3 Environmental Management .................................................................................................................. 26

9 Liquid Waste Area ......................................................................................................................................... 27
  9.1 Operational Management ......................................................................................................................... 27
    9.1.1 Evaporation Ponds ............................................................................................................................ 27
    9.1.2 Fixation Ponds ..................................................................................................................................... 27
  9.2 Environmental Engineering Controls ....................................................................................................... 27
  9.3 Environmental Management .................................................................................................................. 28

10 Tyre Monocell ............................................................................................................................................. 29
  10.1 Operational Management ....................................................................................................................... 29
  10.2 Stockpiling ............................................................................................................................................ 29
  10.3 Baling ...................................................................................................................................................... 29
  10.4 Burial ...................................................................................................................................................... 29
  10.5 Environmental Engineering Controls ..................................................................................................... 29
  10.6 Environmental Management .................................................................................................................. 30

11 Asbestos Monocell Operation ................................................................................................................... 31
  11.1 Operational Management ....................................................................................................................... 31
11.1.1 Excavation of Monocell ................................................................. 31
11.1.2 Unloading ..................................................................................... 31
11.1.3 Burial .......................................................................................... 31
11.2 Environmental Engineering Controls ............................................... 31
11.3 Environmental Management ........................................................... 32
  11.3.1 Asbestos Management ............................................................... 32

12 Class IV Landfill .................................................................................. 33

  12.1 Operational Management ............................................................... 33
    12.1.1 Tip Face Size ........................................................................... 33
    12.1.2 Vehicle Movements .................................................................. 33
    12.1.3 Unloading ................................................................................ 33
    12.1.4 Inspection at Tip Face .............................................................. 34
    12.1.5 Water Bodies ........................................................................... 34
    12.1.6 Waste Placement and Compaction ........................................... 34
    12.1.7 Daily and Intermediate Cover .................................................... 36
    12.1.8 Stability ................................................................................... 37
    12.1.9 First Layer of Waste ................................................................. 37
    12.1.10 Phasing of Filling ................................................................. 37
    12.1.11 Adverse Weather Conditions ................................................. 37

  12.2 Environmental Engineering Controls ............................................. 38
    12.2.1 Basal Lining System ................................................................. 38

12.3 Environmental Management ........................................................... 40

13 General Site Environmental Management ........................................ 43

14 Environmental Monitoring and Sampling ......................................... 48

  14.1 General Monitoring and Sampling Requirements ......................... 48
    14.1.1 Preparation ................................................................................ 48
    14.1.2 Data Recording ........................................................................ 48
14.1.3 Sampling Process ................................................................. 48
14.1.4 Frequency ............................................................................ 49
14.1.5 Laboratory Testing ............................................................... 49
14.1.6 Contingency .......................................................................... 49
14.1.7 Reporting .............................................................................. 49

14.2 Leachate Sampling .................................................................. 49
14.2.1 Sampling locations ............................................................... 49
14.2.2 Sampling Frequency and Parameters ...................................... 49
14.2.3 Exceedance Criteria ............................................................... 50

14.3 Landfill Gas Monitoring ......................................................... 51
14.3.1 Monitoring locations ............................................................ 51
14.3.2 Monitoring Frequency ........................................................... 51
14.3.3 Monitoring Process – Landfill Gas Monitoring Bores ............ 51
14.3.4 Monitoring Process - Surface Emissions ................................. 52
14.3.5 Monitoring Process - Landfill Gas Accumulation .................... 52
14.3.6 Exceedance Criteria ............................................................... 53
14.3.7 Contingency Actions ............................................................. 53

14.4 Surface Water Sampling ......................................................... 54
14.4.1 Sampling Frequency and Parameters ...................................... 55
14.4.2 Sampling location ................................................................. 55
14.4.3 Sampling Process ................................................................. 55
14.4.4 Exceedance Criteria ............................................................. 55

14.5 Groundwater Monitoring and Sampling ................................. 55
14.5.1 Sampling ............................................................................... 56
14.5.2 Exceedance Criteria ............................................................. 57

14.6 Waste Water Sampling ............................................................ 57
14.6.1 Sampling Locations ............................................................... 57
14.6.2 Sampling Frequency and Parameters ...................................................... 57
14.6.3 Sampling process.......................................................................................... 57
14.6.4 Exceedance Criteria....................................................................................... 57
14.7 Feral Animals and Vermin Monitoring............................................................ 57
14.8 Weed Monitoring.............................................................................................. 58

15 Inspections and Maintenance .............................................................................. 59
15.1 Leachate Management System Inspections .................................................... 59
15.2 Landfill Gas Management System Inspections ............................................... 59
15.3 Surface Water Management System Inspections............................................ 60
15.4 Waste Water Management Systems Inspections........................................... 60
15.5 Fire Management System Inspections............................................................. 60
15.6 General site maintenance.................................................................................. 61

16 Incident and Emergency Procedures .................................................................. 62
16.1 Incidents........................................................................................................... 62
  16.1.1 Spills and Leaks......................................................................................... 63
  16.1.2 Major Breach of Landfill Liner................................................................. 63
  16.1.3 Groundwater Contamination.................................................................... 63
  16.1.4 Instability of Waste Mass.......................................................................... 63
16.2 Emergency Procedures ..................................................................................... 64
  16.2.1 Fire............................................................................................................. 64
  16.2.2 Explosions.................................................................................................. 65
  16.2.3 Cyclones..................................................................................................... 65

17 Complaints Register ............................................................................................ 67

18 Compliance Reporting ......................................................................................... 68
  18.1 Annual Environmental Report ...................................................................... 68
  18.2 Annual Audit Compliance Report .................................................................. 68
  18.3 Annual Groundwater Monitoring Report...................................................... 68
19  Rehabilitation and Closure ................................................................. 69

19.1 Objectives ...................................................................................... 69
19.2 Final Waste Profile ........................................................................ 69
19.3 Capping and Rehabilitation ............................................................ 69
19.4 Post Closure Environmental Monitoring ....................................... 70
19.5 Post Closure Maintenance ............................................................. 70

20  Implementation of the OEMP ............................................................ 71

20.1 Roles and Responsibilities ............................................................... 71
  20.1.1 Site Supervisor ........................................................................... 71
  20.1.2 Site Operator ............................................................................. 71
  20.1.3 Contractors ............................................................................. 71

Tables

Table 2-1: Prescribed Premise Categories
Table 4-1: Roles and Responsibilities
Table 5-1: Waste Types Accepted
Table 5-2: Type 2 Special Waste (Clinical Waste) Categories
Table 6-1: Green Waste Processing Environmental Management Measures
Table 7-1: C&D Recycling Facility Environmental Management Measures
Table 8-1: C&D Recycling Facility Environmental Management Measures
Table 9-1: Liquid Waste Area Environmental Management Measures
Table 10-1: Tyre Monocell Environmental Management Measures
Table 12-1: Landfill Environmental Management Measures
Table 13-1: General Site Environmental Management
Table 14-1: Leachate Sampling Parameters and Frequency
Table 14-2: Leachate Exceedance Criteria Levels
Table 14-3: Leachate Level Trigger Criteria
Table 14-4: Landfill Gas
Table 14-5: Landfill Gas Exceedance Criteria
Table 14-6: Surface Water Sampling Requirements
Table 14-7: Groundwater Bores
Table 14-8: Groundwater Parameters and Frequency
Table 14-9: Feral Animal and Vermin Monitoring Requirements
Table 15-1: Leachate Management System Inspections
Table 15-2: Landfill Gas Collection System Inspections
Table 15-3: Surface Water Management System Inspections
Table 15-4: Waste Water Management System Inspections
Table 15-5: Fire Management System Inspections
Table 15-6: General Site Maintenance Schedule
Table 17-1: Complaints Register Process

Appendices

Appendix A : DWER Licence
Appendix B : Asbestos Management Plan
Appendix C : Groundwater Exceedance Criteria
1 Introduction

This Operational and Environmental Management Plan (OEMP) has been prepared for the Pilbara Regional Waste Management Facility (PRWMF) to specify all proposed operational and environmental management procedures to be adopted as part of the overarching management framework. The PRWMF is owned by the Shire of Ashburton (the Shire) and located at 150 Onslow Road.

1.1 Objective of the OEMP

The objectives of the OEMP is to prescribe the operational and environmental measures to be adopted at the PWMF to ensure:

- Compliance with all relevant legislative requirements
- That all potential environmental hazards and risks are recognised and understood
- Appropriate environmental engineering and management measures are implemented at the PRWMF to mitigate environmental impacts
- Compliance with all environmental monitoring and reporting
- All staff members are provided with suitable training on the OEMP
- Adopting a culture of continual improve at the site.

1.2 Continual Improvement

The Shire is committed to ensuring that continual improvement is adopted into the operational and environmental management of the PRWMF. At this stage the Shire is not committed to achieving accreditation, however this will be undertaken in accordance with International Organisation for Standardization ISO14001. The standard provides a framework for organisations to protect the environment and respond to changing environmental conditions. The ISO 14001 Plan-Do-Check-Act (PDCA) review process is a continuous improvement cycle that seeks to increase effectiveness and efficiency of environmental management. The key aspects are Plan, Do, Check and Act.

PDCA is a continuous improvement cycle for implementing change which, when followed and repeated, will lead to improvements in operational an environmental management at the PRWMF. The PDCA framework is broken down below into this various component parts:

- **Plan** identifies targets, delegates work, assigns responsibility and sets a clear action plan with milestones
- **Do** is implementing the plan and collecting data for analysis;
- **Check** is reviewing the data and comparing against the targets to see if the desired result was achieved
- **Act** involves the actions required to address any issues or where improvements are needed in the plan.
1.2.1 Risk Assessments

Risk Assessments are an ongoing requirement for the successful operation of the facility. Risk assessments are required to assess current systems, management and monitoring and to ensure measures are in place and working effectively to mitigate any hazards. The risk assessment is to be undertaken as part of the Annual Review process or following significant alterations to the operations at the PRWMF.

1.3 PRWMF Overview

The PRWMF is an integrated facility that delivers sustainable resource recovery initiatives including the treatment of hazardous wastes, as well as landfill disposal services to a Class IV standard. The PRWMF consists of the following aspects:

- **Bulk Waste Area**:
  - **Green Waste Processing Area**: accept green waste for mulching purposes which may be re-used by the Shire depending on volumes generated.
  - **C&D Recycling Facility**: stockpiling and processing of C&D waste to generate a recycled building product for re-use.
  - **Scrap Metal Stockpiling Area**: designated area for accepting and stockpiling of scrap metal prior recycling offsite.

- **Liquid Waste Area**: will contain fixation and evaporations ponds for the treatment of liquids waste prior to disposal.

- **Tyre and Rubber Monocell**: will accept tyres and rubber for baling and burial in a dedicated monocell to allow for recovery of the material in the future.

- **Asbestos Monocell**: will allow for the safe and separate disposal of asbestos and asbestos containing materials (ACM).

- **Class IV landfill**: will include a double composite lined, fully engineered landfill for acceptance of up to Class IV waste as defined under Western Australia’s Landfill Classification and Waste Definitions 1996 (as amended 2018).

The layout and location of the various elements of the PRWMF is shown in Licence (number to be inserted following approval).
2 Legislative and Best Practice Guidance

2.1 Legislation

The following legislation is deemed relevant to the project:

- Environmental Protection Act 1986 (EP Act)
- Planning and Development Act 2005 (PD Act)
- Environmental Protection (Noise) Regulations 1997
- Waste Avoidance and Resource Recovery Act 2007 (WARR Act)
- Waste Avoidance and Resource Recovery Regulations 2008
- Environmental Protection (Controlled Waste) Regulations 2004
- Biosecurity and Agriculture Management Act 2007
- Aboriginal Heritage Act 1972

2.2 Licence

Licence {number to be inserted following approval} issued by the DWER stipulates the environmental performance standards, monitoring and reporting requirements for the site. Table 2-1 describes the various Prescribed Premises categories, names and descriptions. The maximum throughput capacities are stipulated within the Licence. A copy of the licence is attached in Appendix A.

Table 2-1: Prescribed Premise Categories

<table>
<thead>
<tr>
<th>Category No.</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Crushing of building material</td>
<td>Premises on which waste building or demolition material (for example, bricks, stones or concrete) is crushed or cleaned.</td>
</tr>
<tr>
<td>57</td>
<td>Used Tyre Storage (general)</td>
<td>Premises on which used tyres are stored.</td>
</tr>
<tr>
<td>61</td>
<td>Liquid waste facility</td>
<td>Premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated.</td>
</tr>
<tr>
<td>62</td>
<td>Solid waste depot</td>
<td>Premises on which waste is stored or sorted pending final disposal or re-use.</td>
</tr>
<tr>
<td>63</td>
<td>Class I inert landfill</td>
<td>Premises on which waste (as determined by reference to the waste types set out in the document entitled “Landfill Waste Classification and Waste definitions 1996 (as amended 2018)” published by the Chief Executive Officer and as amended from time to time) is accepted for burial.</td>
</tr>
<tr>
<td>65</td>
<td>Class IV secure landfill</td>
<td>Premises on which waste (as determined by reference to the waste type set out in the document entitled “Landfill Waste Classification and Waste Definitions 1996 as amended 2018”.</td>
</tr>
</tbody>
</table>
### Category No. | Name | Description
--- | --- | ---
85 | Sewage facility | Premises (a) on which sewage is treated (excluding septic tanks); or (b) from which treated sewage is discharge onto land or into waters.

#### 2.3 Best Practice Guidance Documents

The following guidance documents are considered relevant to the PRWMF:

- Victoria Environmental Protection Authority (2015). Best Practice Environmental Management Guidelines for the Siting, Design, Operation and Rehabilitation of Landfills (August 2015)
- Department of Fire and Emergency Services (DFES) Information Note: Bulk Green waste storage Fires
- Department of Fire and Emergency Services (DFES) Guidance Note: GN02 Bulk Storage of Rubber Tyres including Shredded and Crumbed Tyres
- Australian Institute of Petroleum ‘Guidelines for Safe Above Ground Fuel Storage on Farms and Industrial Sites’ (AIP Guideline)
- Australian and New Zealand AS/NZS 5667.1.1998 Water Quality Sampling Guidance on the Design of Sampling Programs, Sampling Techniques and the Preservation and Handling of Samples
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- Department of Water - WQPN 51: Industrial wastewater management and disposal
- Department of Water - WQPN 52: Stormwater management at industrial sites
- Department of Water - WQPN 30: Groundwater Monitoring Bores

The key guidance document utilised on the project is the Environmental Protection Authority (EPA) (Victoria) Best Practice Environmental Management Guidelines for the Siting, Design, Operation and Rehabilitation of Landfills (August 2015). The document provides information on the best practice criteria for siting landfills, design and operational aspects and rehabilitation requirements in order to minimise environmental impacts. The facility has been sited, constructed and operated in general accordance with the standards stipulated within these guidelines to safeguard the environment throughout the lifespan of the facility.
3 Environmental Attributes

3.1 Climate

The climate of the Onslow is considered to be a grassland climate that is hot and subject to summer drought. The lowest minimum mean temperature for Onslow is 13.0°C and highest maximum mean temperature is 36.4°C. The minimum mean monthly rainfall is 0.8mm and maximum is 72.9mm. The Onslow area is arid with a hot humid summer zone and experiences low rainfall. Onslow lies within a region characterised by climate extremes with hot summers, high evaporation (exceeding rainfall by 3,000mm in some areas) and intermittent, intense rainfall events (CSIRO, 2015). The region is prone to cyclonic events which generally occur within the months of November to April. Cyclonic events can pose a risk of flooding, damage to infrastructure and injury to personnel therefore should be monitored on a regular basis.

3.1.1 Wind Direction

The closest wind rose is located at Onslow Airport approximately 26.8km north of the site. The annual wind direction in the morning (9am) ranges from south to east. The wind direction and speed in the morning is south and south-easterly ranging from 10-40km/h. The predominant wind speed is 20-30km/hr from a southerly direction. In the afternoon, winds from a west to north-westerly direction range from 10-40km/h. The predominant wind speed is 20-30km from west north westerly direction.
The wind direction and speeds should be updated on an annual basis according to the latest wind data from the Bureau of Meteorology.

### 3.2 Topography

The topography of the PRWMF varies significantly, with a large proportion of the site being considered relatively flat with a slight incline towards the south-east. A large (3km long, 350m wide at its widest point) sand ridge is located along the site’s north-eastern boundary. The site’s topography varies from 14m Australian Height Datum (AHD) on the flat area to 40m AHD at the highest points of the sand ridge.

### 3.3 Geology

Based on the geotechnical site investigations that were undertaken during the planning phase of the PRWMF, the general soil profile at the site consists of (in descending order from ground level):

- Sand – loose, fine to medium grained (Pindan) generally corresponding to the sand dune ridge
- Sandy clayey silt/silty clayey sand – loose to dense, fine to medium grained, rounded to sub-rounded, red brown and dry (Pindan)
- Cemented gravel/silcrete – cemented gravels in silty sand/sandy silt matrix – hard, red brown and white, becoming brown with depth, and dry
- Sandstone interfingered with cemented gravel – medium grained, occasional clasts, siliceous veins and vugs, dry, red to yellow.

3.4 Groundwater

Groundwater below the site flows in a westerly/north-westerly direction, mirroring the regional aquifer that flows towards the Ashburton River and Indian Ocean located approximately 20 and 40 km away respectively. The average depth to groundwater ranges from 5.389 metres below ground level (mbgl) to 7.266 mbgl on the flat plain. The design of the landfill facility achieves a minimum separation distance of 2.9 metres at this lowest point. Groundwater beneath the site is ‘brackish’ and neutral and dominated by sodium chloride ions, with concentrations of chloride in exceedance of the DER, 2014 NPUG assessment criteria.

3.5 Hydrogeology

The hard rock geology is recorded as the Windalia Radiolarite Formation, which forms part of the Carnarvon Artesian Basin. Permanent superficial/perched aquifers may exist seasonally. Permeability of the superficial soils range between $9.0 \times 10^{-6}$ m/s and $1.0 \times 10^{-6}$ m/s for the silty sand horizon and between $4.8589 \times 10^{-8}$ m/s and $6.107 \times 10^{-9}$ m/s for the sandy silt horizon. The cemented gravel/silcrete has a permeability of between $1.6339 \times 10^{-7}$ m/s and $3.382 \times 10^{-9}$ m/s. The hydraulic conductivity was calculated to be 0.36 m/day; however, rates vary across the site and may be greater in some locations. These ranges are within the expected range for a fine to medium grained sandstone.

3.6 Flora and Vegetation

A Detailed Flora and Vegetation survey (Phoenix Environmental, 2018) was undertaken during the planning phase of the PRWMF. The survey found that the site consisted of four vegetation types which represented the broad vegetation association Hummock grasslands, shrub steppe; kanji over soft spinifex & *Triodia basedowii* and were determined to be of low regional conservation significance.

Vegetation on the flat plain was found to consist of a Hummock Grassland 1, *Triodia basedowii* grassland (with isolated *Corymbia hamersleyana* and/or *C. zygophylla* mallee) and vegetation on the sand ridge/dune was dominated by an Open Shrubland 1, *Grevillea stenobotrya* over *Quoya loxocarpa* in *Triodia schinzii* grassland interspersed by areas of Open Mallee Woodland.

No Threatened Ecological Communities or Priority Ecological Communities were found to be present within the site. Two Priority Flora have been recorded within the site during the survey; *Abutilon* sp. Pritzelianum (P1) (3 plants) and *Triumfetta echinata* (1 plant) and are likely to persist as seed in the soil seedbank.
3.7 Introduced Flora

One introduced species *Cenchrus ciliaris* (Buffel grass) was recorded during the Detailed Flora and Vegetation survey undertaking in 2017. Buffel grass is a tufted or sometimes stoloniferous perennial grass that grows to approximately 1.5m high and has a purple flower. The grass flowers in February to October. The seeds are generally dispersed by wind, water and animals. Management of the species is discussed in Section 14.8.

3.8 Fauna

During the Level 1 Flora and Fauna survey undertaken during the project planning phase, no conservation significant fauna were identified within the site. The listed migratory species Rainbow Bee-eater (*Merops ornatus*) was observed however, the species is considered to be common and widespread.

3.9 Conservation Reserve

The PRWMF is located approximately 36km north-west of the Cane River Conservation Park. The site has been exercised from the proposed Cane River Conservation Park extension area.
4 Operational Aspects

4.1 Operator

The PRWMF is owned by the Shire and is operated by [insert contractor name] under a contractual arrangement. The contact details for Shire’s Waste Services Manager and the Contractors Site Manager are listed below: are:

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Shire of Ashburton</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>PO Box 567</td>
<td>To be determined</td>
</tr>
<tr>
<td>Website</td>
<td><a href="https://www.ashburton.wa.gov.au/">https://www.ashburton.wa.gov.au/</a></td>
<td>To be determined</td>
</tr>
<tr>
<td>Primary Contact</td>
<td>To be determined</td>
<td>To be determined</td>
</tr>
<tr>
<td>E mail address</td>
<td>To be determined</td>
<td>To be determined</td>
</tr>
<tr>
<td>Contact number</td>
<td>08 9188 4444</td>
<td>To be determined</td>
</tr>
</tbody>
</table>

4.2 Operating hours

The PRWMF will operate between the hours of 06:00 to 17:00 Monday to Sunday.

4.3 Staff Structure

The staffing organisational structure for the PRWMF is shown in Diagram 3 below. The Shire staff is shown in orange and contractor staff in green.
The general responsibilities of each staff member are outlined in Table 4-1 below.

Table 4-1: Roles and Responsibilities

<table>
<thead>
<tr>
<th>Role</th>
<th>Organisation</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Services Manager</td>
<td>Shire</td>
<td>Responsible for the overall legislative compliance for the facility and contractual management</td>
</tr>
<tr>
<td>Site Manager</td>
<td>Contractor</td>
<td>Responsible for the contractual management for the Contractors perspective and site operations</td>
</tr>
<tr>
<td>Site Supervisor</td>
<td>Contractor</td>
<td>Responsible for overseeing and managing the day-to-day operation of the facility.</td>
</tr>
<tr>
<td>Weighbridge attendant</td>
<td>Shire</td>
<td>Responsible for the operation of the weighbridge, undertaking inspections, implementing waste acceptance procedures and financial arrangements.</td>
</tr>
<tr>
<td>Site Operator(s)</td>
<td>Contractor</td>
<td>Responsible for the operation of machinery and equipment and ensuring waste materials are correctly treated, processed or disposed of.</td>
</tr>
</tbody>
</table>

4.4 Visitors and Contractors

All contractors and visitors to the must report to the weighbridge/gatehouse prior to entry. The weighbridge attendant must determine the purpose for the visit/works and notify the Site Supervisor. The site visitor or contractor is to be directed to the visitor parking area. All visitors and contractors are to sign the visitor’s registry. The Weighbridge Attendant and other PRWMF staff are required to ensure that Visitors and Contractors wear appropriate PPE at all times while on site. Any visitors and contractors that are to undertake works at the PRWMF are to complete a site induction prior to commence any such activities.

4.5 Machinery and Equipment

The machinery and equipment required to operate the facility includes:

- Landfill compactor
- Back hoe excavator
- Forklift
- Dump truck
- Utility vehicle
- Water cart.

Machinery and equipment will be maintained on a regular basis by external contractors to ensure safe and efficient operations. Cleaning of vehicles will be undertaken when required and must be conducted on the wash-down bay to ensure waste water containing hydrocarbons and other
contaminants are captured for treatment. All details of maintenance undertaken should be recorded.

Regular pre-start checks will be undertaken prior to the operation of vehicles and machinery. A record of the pre starts should be kept with the vehicle or machinery.

Ultra-High Frequency (UHF) radios will be used in all site vehicles and machinery. Personnel located outside machinery must have a hand held radio. All site communications shall be made on channel {insert channel number}. Channel {insert channel number} shall be used for emergency purposes only.

All site vehicles and machinery shall be fitted with roof mounted flashing lights which must be on when moving around the site.

4.6 Signage

Signs are required at the entrance of the site. The signs should details the following information at a minimum:

- Operating hours
- Speed limits
- Waste types accepted
- Emergency Contact/s.

Other signs required around the site include:

- PPE required
- Warning signs
- Traffic directions
- Hazard identification.

The signs must be installed to satisfy relevant workplace health and safety requirements and should be maintained in good condition and replaced, when necessary. A maintenance schedule is provided in Section 15.

4.7 Site Inductions

Prior to undertaking any work at the facility all personnel shall be inducted to understand the layout of the site, operational activities, safety requirements, environmental management, legal obligations and emergency procedures. The site induction shall be updated on a regular basis or as required. An induction register is maintained by the Site Supervisor.

4.8 Job Safety Analysis

A Job Safety Analysis (JSA) is a practical safety assessment tool to review work steps and identify hazards. A JSA is undertaken prior to relevant works being undertaken on site. The JSA aims to ensure all tasks are undertaken safely and risks are minimised. All personnel are made aware of the
requirements to complete a JSA in the site induction. All JSA’s must be reviewed by the Site Supervisor.

4.9 Personal Protective Equipment

The minimum Personal Protection Equipment (PPE) requirements for the site include:

- Long sleeved high visibility shirt or high visibility vest
- Safety boots (steel capped)
- Long trousers
- Wrap safety glasses conforming to Australian Standards, with side protection.

Additional PPE may be required depending on the nature of the works required. To determine the PPE required, a task specific risk assessment shall be undertaken. All staff are required to wear appropriate PPE as instructed by the Site Supervisor. Depending on the outcome of the risk assessments, additional PPE that may be required includes:

- Broad brimmed hats
- Gloves
- Hearing protection to be worn in designated areas and/or when undertaking noisy tasks
- Respiratory protection equipment must be worn if dealing with fumes or dust from hazardous materials
- Broad spectrum sunscreen is to be worn when working outside.

Jewellery such as rings, necklaces etc. that may be caught in equipment should be removed.

The PPE required for handling asbestos material will be determined by a component person and includes the following:

- Safety goggles
- Respirator or Mask
- Disposable coveralls
- Disposable gloves
- Disposable overshoes or washable boots.
5 Weighbridge Procedure and Waste Acceptance

The operational procedures for the acceptance of waste at the PRWMF is outlined in the subsections below. All waste acceptance activities will be undertaken in accordance with the Licence [insert licence number]. Waste will be accepted as per the requirements of the Department of Water and Environmental Regulation’s ‘Landfill Waste Classification and Waste Definitions’ (April 2018).

5.1 Weighbridge Procedure

The weighbridge procedure is as follows:

- All vehicles carrying waste must report to the weighbridge for the inspection of loads and data gathering.
- All vehicles shall be recorded by CCTV to monitor vehicle movements to and from the site.
- All loads shall be inspected using the infra-red camera to identify any ignited loads.
- All waste vehicles shall be weighed on entry to and exit from the site. A computerised weighing system will recorded the weight of vehicles on entry and exit of the facility. The quantity of waste will be calculated by measuring the total gross weight on entry minus the total tare weight on exit.
- All other vehicles must describe the waste load and source or provide a relevant documentation (transfer note, laboratory results, Controlled Waste Transport Form (CWTF), etc.) prior to accessing the weighbridge.
- Waste loads may be inspected via CCTV camera on the viewing platform for signs of contaminant or non-compliant loads;
- If further examination is required following viewing through CCTV, the weighbridge attendant may physically inspect the load from the viewing platform.
- A Controlled Waste Tracking System (CWTS) will track all controlled waste received at the facility that exceeds 200 kilograms or litres. The web based database system will allow for the efficient collection of controlled waste data for reporting to the DWER. Controlled waste carriers will issue a CWTF that contains a unique identity number and information regarding the waste type, volume, waste holder details and carrier details.
- Upon entering and once weighed, accepted loads will be directed to the designated area of the PRWMF for unloading.
- In the event that non-conforming waste materials are discovered within a vehicle, it will be denied access.
- Alternatively, if a vehicle is supposedly carrying a clean stream, such as green waste or C&D but it is identified as being contaminated following inspection, this material will be directed to the landfill and charged the relevant disposal costs.
- If contamination is identified while unloading the materials, the generator will be ordered to reload the material and redirected to the landfill for disposal and will be charged accordingly.
- If contamination is identified while unloading the materials, the generator will be ordered to reload the material and redirected to the landfill for disposal and the generator will be charged accordingly.
All waste loads not meeting the requirements of the licence conditions, packaging/containment requirements, dangerous loads or contaminated loads will be rejected. The details of the waste including source, weight, waste type and reason for rejection will be recorded in the Rejected Loads Register.

5.2 Waste Types Accepted

The PRWMF is licenced to accept the waste types listed in Table 5-1. The definitions of each waste type are sourced from the 'Landfill Waste Classification and Waste Definitions 1996' (April, 2018). Examples of the types of materials for each waste type are also provided.

### Table 5-1: Waste Types Accepted

<table>
<thead>
<tr>
<th>Waste Types</th>
<th>Definitions</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean Fill</td>
<td>Raw excavated natural material such as clay, gravel, sand, soil or rock fines that: (a) has been excavated or removed from the earth in areas that have not been subject to potentially contaminating land uses including industrial, commercial, mining or agricultural activities; and (b) has not been processed except for the purposes of: i. achieving desired particle size distribution; and/or ii. removing naturally occurring organic materials such as roots; and (c) does not contain any acid sulfate soil; and (d) does not contain any other type of waste</td>
<td>Clay, gravel, sand, soil or rock fines that has been excavated or removed from the earth in areas that have not been subject to potentially contaminating land uses including industrial, commercial, mining or agricultural activities.</td>
</tr>
<tr>
<td>Uncontaminated fill</td>
<td>(a) inert waste type 1 (excluding asphalt and biosolids) that meets the requirements set out in Table 6, as determined by relevant sampling and testing carried out in accordance with the requirements set out in Table 7; and (b) neutralised acid sulfate soil that meets the requirements for relevant metals, metalloids and sulfate set out in Table 6, as determined by relevant sampling and testing carried out in accordance with the requirements of Table 7.</td>
<td>Asphalt, biosolids and neutralised acid sulfate soils.</td>
</tr>
<tr>
<td>Neutralised acid sulphate soil</td>
<td>Neutralised acid sulfate soil treated in accordance with Identification and investigation of acid sulfate soils and acidic landscapes (DER, 2015) and Treatment and management of soil and water in acid sulfate soil landscapes (DER, 2015).</td>
<td>Neutralised acid sulfate soils.</td>
</tr>
</tbody>
</table>
## Waste Types

<table>
<thead>
<tr>
<th>Waste Types</th>
<th>Definitions</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inert Waste Type 1</td>
<td>Means non-hazardous, non-biodegradable (half-life greater than two years) wastes containing contaminant concentrations less than Class I landfill acceptance criteria, but excluding paper and cardboard and materials that require treatment to render them inert (e.g. peat, acid sulfate soils).</td>
<td>Building and demolition waste, asphalt waste, casting sand, blasting sand and garnet.</td>
</tr>
<tr>
<td>Inert Waste Type 2 (with specific licence conditions)</td>
<td>Waste consisting of stable non-biodegradable organic materials such as tyres and plastics which require special management to reduce the potential for fires.</td>
<td>Tyres and plastics</td>
</tr>
<tr>
<td>Putrescible waste</td>
<td>Component of the waste stream likely to become putrid - including wastes that contain organic materials such as food wastes or wastes of animal or vegetable origin, which readily bio-degrade within the environment of a landfill.</td>
<td>Municipal waste, food waste, biosolids, sewerage, manures, carcasses, office and packaging waste etc</td>
</tr>
<tr>
<td>Contaminated Solid Waste meeting criteria specified for Class II, Class III or Class IV landfills</td>
<td>Contaminant* means a substance or object in contact or mixed with a material that presents, or has the potential to present, a risk of harm to human health, the environment or any environmental value.</td>
<td>Contaminated soils</td>
</tr>
<tr>
<td>Type 1 Special Wastes</td>
<td>Waste which includes asbestos and asbestos cement products.</td>
<td>Asbestos and asbestos cement products</td>
</tr>
<tr>
<td>Type 2 Special Wastes</td>
<td>Special Waste Type 2 Waste consisting of certain types of biomedical waste which are regarded as hazardous but which, with the use of specific management techniques, may be disposed of safely within specified classes of landfill.</td>
<td>Clinical waste</td>
</tr>
</tbody>
</table>

*Contaminant thresholds values are listed in table 3 of the 'Landfill Waste Classification and Waste Definitions 1996' (April, 2018).

### 5.3 Controlled Waste Acceptance

Controlled wastes are defined in Schedule 1 of the Environmental Protection (Controlled Waste) Regulations 2004 (Controlled Waste Regulations). Prior to delivery and acceptance, certain wastes must undergo pre-treatment or must be stored and transported in appropriate containers to minimise the potential risks to human health and the environment.

To meet the requirements of the Controlled Waste Regulations, the controlled waste carrier must present a Controlled Waste Tracking Form (CWTF) on arrival at the weighbridge for any bulk controlled waste and loads of packaged controlled waste over 200 kilograms or litres. The CWTFs are...
valid for a total of 7 days. The CWTF may be presented either electronically or in paper format. The CWTF must include the following information:

- Waste holder’s name or identification number
- Waste holder’s address
- Name and address of waste facility
- Type of controlled waste
- Date loaded onto or into the vehicle or tank
- Amount of controlled waste
- Type and amount of controlled waste unloaded at waste facility without the occupier being present and date of unloading (if applicable)
- Type and amount of controlled waste loaded onto or into, or unloaded from, vehicle or tank at transit facility, and date of loading or unloading (if applicable)
- Containment type (bulk or packaged)
- Driver’s name
- Driver’s licence number (if a licence is required under the regulations)
- Vehicle registration number
- Tank licence number (if a licence is required under the regulations)
- Carrier’s name
- Carrier’s licence number
- Vehicle or tank capacity.

On receipt of the CWTF, the gatehouse must record the following information on the CWTF:

- Name and address of waste facility
- Date of receipt of waste at the waste facility
- Type of controlled waste received
- Amount of controlled waste received
- Type of disposal, treatment or handling of controlled waste at the waste facility discrepancies.

The specific weighbridge acceptance requirements for each controlled waste i.e. liquid wastes, tyres, Type 1 special waste (asbestos), Type 2 special waste (clinical waste) and neutralised acid sulphate soils are detailed below.

5.3.1 Liquid wastes

Prior to acceptance, hazardous liquid waste must be tested to ensure it meets the contaminant concentration thresholds as outlined in Table 4 of the ‘Landfill Waste Classification and Waste Definitions’ (April 2018). Liquid wastes must be contained and transported in sealed leak proof containers or liquid waste trucks.

A CWTF must be completed prior to arrival the weighbridge for any liquid wastes exceeding 200 litres. The liquid wastes that may be accepted and their respective controlled waste categories include:
• Acids (B)
• Bases (C)
• Inorganic chemicals (D)
• Paints, resins, inks and organic sludges (F)
• Organic solvents (G)
• Pesticides (H)
• Oils (J)
• Industrial waste waters (L)
• Organic chemicals (M)
• Sludges (N).

All accepted loads will be weighed and entered into the Accepted Loads Register and directed to the Liquid Waste Area. All non-conforming loads will be rejected and entered into the Rejected Loads Register.

5.3.2 Tyres

On arrival at the weighbridge all tyres loads exceeding 200kg must provide a CWTF. As a general guide, approximately 25 used car tyres equals 200kg. After the load has been entered into the CWTS, the load must be inspected for contamination or signs of ignition through the use of the infrared camera. Accepted loads will be weighed and entered into the Accepted Loads Register. All non-conforming loads will be rejected and entered into the Rejected Loads Register.

5.3.3 Type 1 Special Wastes (Asbestos)

The PRWMF will be licenced to accept asbestos, asbestos containing material (ACM) and material contaminated with asbestos (contaminated soils). It is the responsibility of the customer under the Controlled Waste Regulations to inform the facility of asbestos requiring disposal 24 hours prior to arrival. All declared asbestos loads shall be inspected to ensure the waste has been wrapped according to the pre acceptance requirements:

- Friable asbestos and fragmented non-friable asbestos:
  - Must be wrapped in a minimum 200 μm thickness new polythene bags which are:
    - not damaged
    - not more than half full minimise the risk of tearing and to assist in manual handling;
    - have all air expelled (carefully to avoid the release of dust)
    - twisted slightly, folded over and secured with adhesive tape
    - double bagged (friable asbestos)
    - Secured in a lined and sealed drum/container or truck clearly labelled with a dangerous goods and asbestos warning label
  - Asbestos contaminated soils:
    - Must be transported in a sealed container or truck and kept wet at all times.

- Non-friable or bonded asbestos (asbestos sheeting):
  - Must be double wrapped in a minimum of 200 μm thickness new and undamaged polythene bags
5.3.4 Type 2 Special Wastes (Clinical Waste)

The Class IV landfill will be licenced to accept clinical wastes if they meet the pre acceptance criteria. Due to the nature of clinical waste it is critical that these are segregated, packaged, labelled and transported correctly to avoid the transmission of diseases. All loads must be contained/sealed on entry according to standard AS/NZS4261:1994. Clinical waste must be sealed in secure containers that are leak, puncture and shatter proof. Containers shall be correctly labelled with the international biohazard symbol and clearly display the words ‘clinical waste’. All containers must also possess a description of the contents.

Diagram 4: Biohazard symbol

Pharmaceutical wastes must be contained in non-reactive tamper and rupture proof containers that have the capacity to capture spills.

Volumes exceeding 200 litres or kilograms must be accompanied by a CWTF on arrival. Clinical and pharmaceutical waste fall under category group R. Category group R contains four individual waste codes (R100, R120, R130 and R140). Examples of waste accepted under these categories are shown in.

Table 5-2: Type 2 Special Waste (Clinical Waste) Categories

<table>
<thead>
<tr>
<th>Clinical Waste Category</th>
<th>Examples</th>
</tr>
</thead>
</table>
| R100 Clinical and Related Wastes | • Sharps waste;  
• Infectious waste;  
• Human tissue waste such as organs, limbs and placenta;  
• All free-flowing liquid body substances (for example blood);  
• Dressings saturated with blood/body fluids;  
• Laboratory waste, tissue samples and specimens or cultures discarded in the course of medical dental or veterinary practice or research; and  
• Animal waste from medical or veterinary research or treatment |
### Clinical Waste Category

<table>
<thead>
<tr>
<th>Clinical Waste Category</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>that may be poisonous or infectious.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R120 Waste Pharmaceuticals, Drugs and Medicine</th>
<th>Pharmaceutical waste for the purposes of this category includes (but is not restricted to) waste material that may arise from pharmaceutical products that have:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Passed their recommended shelf life;</td>
</tr>
<tr>
<td></td>
<td>• Been discarded due to off-specification batches or contaminated packaging;</td>
</tr>
<tr>
<td></td>
<td>• Been returned by patients or discarded by the public; and</td>
</tr>
<tr>
<td></td>
<td>• Been assessed as no longer required during manufacture of pharmaceuticals; and</td>
</tr>
<tr>
<td></td>
<td>• Pharmaceutical waste may also include any drugs listed in the substances schedules of the poisons act 1964.</td>
</tr>
</tbody>
</table>

| R130 Cytotoxic Waste | Cytotoxic waste includes waste material, such as sharps, contaminated with a cytotoxic drug. |

| R140 Waste from the Production or Preparation of Pharmaceutical Products | This waste code includes pharmaceuticals, drugs and medicine waste from the production or preparation of pharmaceutical products. |

Source: DER Controlled waste Fact Sheet: Transporting Clinical and Pharmaceutical Waste (June 2016)

The weighbridge attendant will notify the Site Operator of the acceptance of clinical waste. Following confirmation from the Site Operator the customer will be directed to the Class IV landfill. All non-conforming loads will be rejected and entered into the Rejected Loads Register.

#### 5.3.5 Contaminated Solid Wastes

The facility will be licensed to accept contaminated solid waste up to Class IV. This means that waste materials must meet the contaminant thresholds listed in Table 3 of the ‘Landfill Waste Classification and Waste Definitions’ (April 2018). Contaminated solid wastes must be sampled and analysed prior to arrival onsite. Contaminated solid wastes must be contained in sealed or covered containers, bins or trailers in order to be accepted. Contaminated soils and loose materials must be kept moist at all times.

#### 5.3.6 Neutralised Acid Sulphate Soils

Volumes of neutralised Acid Sulphate Soils (ASS) exceeding 200kg must be accompanied by a CWTF on arrival at the weighbridge. ASS can only be accepted at the facility following neutralisation. The customer must present evidence of pre-treatment through a receipt or other records and the volume of ASS requiring disposal. Suspect ASS may be visually inspected for signs such as:

- Sulphurous smell e.g. hydrogen sulfide or ‘rotten egg’ smell
- Blue or green material
- Pale yellow staining or mottling
- Water logged soils with soft buttery blue grey or dark greenish grey muds
- Mid to dark grey estuarine silty sands
- Dark grey to black bottom sediments of estuaries.

Suspect ASS may be/will be tested with a hand held soil pH meter. If ASS is likely or confirmed, the load will be rejected and entered in the Rejected Loads Register. If the soil is confirmed as neutralised, it will be weighed and entered into the Accepted Loads Register.

5.4 Construction and Demolition Waste Acceptance

All customers delivering Construction and Demolition Waste (C&D) loads must provide details on the type of C&D materials and source of the material. All C&D loads will undergo a primary inspection at the weighbridge to identify any contamination. C&D loads may be contaminated with non-recyclable inert materials, timber, metal, plastics and small volumes of green waste, asbestos or asbestos containing material (ACM). If loads entering the site contain nonhazardous contamination which is not able to be easily removed from the load, the load will be directed to Class IV landfill for disposal. If asbestos is identified, the weighbridge attendant will issue a fine to the customer and reject the load. All non-conforming loads will be entered into the Rejected Loads Register. If the C&D load passes the visual inspection and is accepted, it will be assigned an asbestos risk rating of either ‘low’ or ‘high’. All accepted loads will be weighed and entered into the Accepted Loads Register and directed to the appropriate unloading area. The management measures if asbestos or ACM is identified during unloading at the C&D recycling facility is detailed in Section 11.3.1.

5.5 Prohibited Wastes

Certain types of intractable wastes are not permitted to be disposed of the PRWMF. Intractable waste is defined as “waste that is a management problem by virtue of its toxicity or chemical or physical characteristics which make it difficult to dispose of or treat safely and is not suitable for disposal in a Class I, II, III or IV landfill. Provided there is no practical alternative destruction or treatment technology, these are disposed of in Class V facilities” (DEC, 2009). Examples of intractable waste include radioactive waste, significantly contaminated soils, industrial sludges and some spent catalyst wastes. There are some intractable wastes that are accepted and treated appropriately prior to disposal. Intractable wastes accepted at the facility, include industrial sludges and spent catalysts. These wastes will be subject to chemical fixation in the Fixation Ponds within the Liquid Waste Area in order to convert the material to a Class IV standard suitable for disposal. All waste undergoing fixation will be subject to testing prior to disposal to ensure the waste meets the required standard.
6 Green Waste Processing Area

The Green Waste Processing Area is located within the Bulk Waste Area and caters for the treatment of green waste through mulching. The volume of green waste will be reduced through the mulching process with the end product being utilised for a range of applications including landscaping, rehabilitation or used in the fixation process in the Liquid Waste Area. The Green Waste Processing Area includes a stockpiling and a processing area. The operational and environmental management measures are detailed in the following subsections.

6.1 Operational Management

6.1.1 Unloading

Green waste materials will be brought to the designated drop off area. The Site Operator will inspect the material during unloading when relevant, particularly for suspected contaminated loads. The materials will be unloaded onto the low permeability hard standing area. This will provide the opportunity for visual inspections of the material. Any minor contamination will be removed and disposed of in the landfill. If major contamination is detected the load will not be accepted, removed into the generators vehicle and a fine / additional charge issued. If the generator cannot be identified, the material will be disposed to landfill the contamination cannot be separated. A 10m cleared area will be maintained between stockpiles for front end loaders and other plant manoeuvres.

6.1.2 Stockpiling

Green waste must only be stockpiled on the low permeability hardstand area. Stockpiles have a maximum width of 10m, height of 3m and length of 50m. Stockpiles are to be kept neat and tidy as far as practicable.

6.1.3 Processing

Once stockpiles reach a sufficient size or stockpile space is becoming limited, the Site Supervisor shall be notified. The Site Supervisor shall arrange for the green waste contractor and mobile mulching or shredder plant to come to site to process the green waste. Processing of the green waste will be undertaken in accordance with the green waste contractor’s procedures and safety requirements.

6.1.4 Recycled Product

The mulched product will be stockpiled and utilised for landscaping, rehabilitation or used in the fixation process in the liquid waste area as required.

6.2 Environmental Engineering Controls

The environmental engineering controls for the Green Waste Processing Area includes:

- Low permeability hardstand area with a 1:200 slope gradient (north east to south east)
- Pond constructed with double a composite lining system (Section 12.2.1)
• Drainage pond capacity for 1 in 10 year storm, 72 hour event with underlying low permeability compacted subgrade
• Pump to divert excess stormwater from the drainage pond
• Associated infrastructure (surface water swale and pipework)
• Drainage pond with a free board of 0.4m.

6.3 Environmental Management

The key environmental risks associated with the Green Waste Processing Facility are:

• Odour
• Leachate
• Dust
• Fire risk.

Odours will be generated from the green waste and mulch stockpiles through the natural biodegradation of the material and through the generation of leachate. Although the generation of odours will be unavoidable due to the nature of the process management measures will be adopted at the Green waste Processing Area to minimise odour generation and impacts. Leachate may be generated through the percolation of water through green waste which can result in contamination of surface water, groundwater and the soils. Bioaerosols can be generated when microbes from green waste attach to dust presenting a health risk to staff. Greenwaste can also present a fuel source and therefore a fire risk. The risk of fires has been assessed and appropriate management developed. The management measures for odour leachate, dust and fire risk are detailed in Table 6-1.

Table 6-1: Green Waste Processing Environmental Management Measures

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Management Measures</th>
</tr>
</thead>
</table>
| Odour    | • Consideration of metrological conditions during the handling of green waste stockpiles to determine wind direction and potential onsite odour impacts  
|          | • Maintain aerobic stockpile through regular turning to minimise the generation of odour from decomposing green waste  
|          | • Minimising the moisture content of the stockpiles by minimising surface water runoff onto the green waste processing area through maintenance of drainage system  
|          | • Duration of stockpiling to be minimised where possible to reduce potential odours  
|          | • Minimising the size of the stockpiles (maximum of 3m height and 10m width)  
|          | • Maintenance of stockpile area levels to ensure no water logging occurs  |
| Leachate | • Maintenance of a low permeability hardstand area to approximately 200mm to provide a protection barrier  
|          | • Utilise a pump to extract any excess water to the leachate evaporation ponds to direct this material to the larger leachate ponds on site  
<p>|          | • Regular inspection and maintenance of stockpile area level to ensure no water logging occurs  |</p>
<table>
<thead>
<tr>
<th>Aspect</th>
<th>Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust</td>
<td>- Regular inspection and maintenance of the drainage pond and associated infrastructure</td>
</tr>
<tr>
<td></td>
<td>- Review the drainage pond capacity if greenwaste operations expand</td>
</tr>
<tr>
<td></td>
<td>- Use of 10,000L water cart or water sprinklers to lightly wet down stockpiles during material handling</td>
</tr>
<tr>
<td></td>
<td>- Minimise unnecessary material handling activities to avoid the generation of dust</td>
</tr>
<tr>
<td></td>
<td>- Avoid handling of green waste stockpiles during periods of strong winds</td>
</tr>
<tr>
<td></td>
<td>- Use of PPE during handling of green waste if personnel are located outside of vehicles to prevent inhalation of bioaerosols</td>
</tr>
<tr>
<td>Fire Risk</td>
<td>- Maintain a maximum mulch stockpile height of 3m and width of 10m</td>
</tr>
<tr>
<td></td>
<td>- Maintain a separation distance of 10m between each green waste stockpile</td>
</tr>
<tr>
<td></td>
<td>- Staff to undergo training to recognise the signs of green waste fires and control methods</td>
</tr>
<tr>
<td></td>
<td>- Maintain a 100 m buffer zone around the green waste stockpile area</td>
</tr>
<tr>
<td></td>
<td>- Green waste stockpiles are not be located near ignition sources</td>
</tr>
<tr>
<td></td>
<td>- Green waste stockpiles are to be monitored during extreme weather conditions and total fire ban days</td>
</tr>
<tr>
<td></td>
<td>- No smoking is to occur near stockpiles</td>
</tr>
<tr>
<td></td>
<td>- Fire suppression equipment is to be located in close proximity to the Green Waste Processing Area</td>
</tr>
<tr>
<td></td>
<td>- Use of 10,000L all-wheel drive water cart for fire suppression</td>
</tr>
</tbody>
</table>
7 C&D Recycling Facility

The C&D recycling facility is located within the Bulk Waste Area and diverts mixed rubble and clean construction and demolition material streams from landfill. Clean inert materials include concrete, asphalt, tiles, bricks, sands, gravels and soils. The facility accepts inert materials from commercial customers, earthworks companies, construction and demolition companies and the Shire. It also receives clean inert material accepted by the public, via the Onslow Waste Transfer Station. The operational and environmental management measures are detailed in the following subsections.

7.1 Operational Management

7.2 Unloading

Vehicles will bring C&D loads to the designated unloading area (high risk or low risk area), where trucks and trailers will self-unload the inert waste material. C&D materials will be unloaded in a manner to minimise the generation of dust. As the PRWMF will mainly be accepting clean, source separated materials, only simplistic sorting of materials will be required, which will be achieved by having designated areas for the deposition of the various types of materials including sand, concrete and asphalt, etc. During unloading the site operator will inspect the waste to identify any contamination including the presence of asbestos. The management of asbestos contamination is detailed in the Asbestos Management Plan (Appendix B).

7.3 Stockpiling

C&D waste will be stockpiled until sufficient quantities are available for processing. Stockpiles will be kept at a maximum of 3m height. Stockpiles will be kept as neat and tidy as practicable.

7.4 Processing

Once sufficient quantities of C&D are achieved, the materials will be periodically processed through a mobile recycling plant. The C&D materials will be processed via screening, sorting and crushing to generate Recycled Building Products such as recycled sand, aggregates and road base. Inert materials will be loaded into the hopper of a jaw crusher for primary crushing with the use of an excavator or similar. The Recycled Building Products are to be sorted in separate stockpile as per the product types.

7.5 Recycled Building Products

The Recycled Building Products will be stockpiled on site prior to re-use on site and potentially offsite. The product will be predominantly used for hardstand areas and other civil engineering requirements.
7.6 Environmental Engineering Controls

The environmental engineering controls for the C&D Recycling Facility includes:

- Low permeability hardstand area with a 1:200 slope gradient (north east to south east);
- Designated storage areas for the inputs and Recycled Building Products; and
- Water supply for dust suppression.

7.7 Environmental Management

The key environmental risks associated with the C&D Recycling Facility are:

- Dust
- Noise
- Contamination (asbestos).

Dust will be generated through the handling and processing of C&D waste materials. The operation of crushing and screening plant for processing C&D waste will generate noise that has the potential to reduce amenity and impact operators.

There is the potential for C&D waste to be contaminated with materials such as asbestos. The management of asbestos is detailed in the Asbestos Management Plan (Appendix B).

To mitigate environmental impacts from the C&D Recycling Facility, the following management measures for dust, noise must be implemented.

**Table 7-1: C&D Recycling Facility Environmental Management Measures**

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Environmental Management Measures</th>
</tr>
</thead>
</table>
| Dust   | A sprinkler system is incorporated within the material acceptance, processing and storage areas  
|        | Dust suppression equipment will be used when plant is operating  
|        | Plant operation will be minimised if dust suppression equipment is out of order, e.g. relevant sections of plant will not be operated until the dust suppression equipment in that section has been repaired  
|        | Dust suppression equipment will be maintained to ensure continual and optimal working order  
|        | Materials are to be dampened down prior to handling and processing (as required)  
|        | The drop distance between discharge points and collection point will be minimised  
|        | Vehicles are restricted to a maximum speed of 10 km/h on unsealed roads and areas  
|        | Processing is stopped during periods of high winds  
|        | All inert waste materials are confined within the designated storage area  
|        | A 10,000L water cart is utilised as required  
|        | Mobile Water Cart on unsealed areas of site to be employed only as required by atmospheric conditions to maintain a damp surface and prevent fine material becoming airborne. No pooling or run-off of water should be observed |
### Noise

- Waste receival and the operation of equipment and machinery on site is restricted to operational hours only.
- Vehicles are restricted to a maximum speed of 10km per hour (km/h) on unsealed roads and areas.
- Noise reducing workplace procedures will be adopted such conservative material handling operations and tipping materials from the lowest height possible;
- White noise alarms to be installed in all vehicles and machinery; and
- All equipment, plant and machinery will be maintained in good working condition.
8 Scrap Metal Stockpiling Area

A scrap metal stockpiling area is located in the Bulk Waste Area for the storage of scrap metal for offsite recycling. The operational and environmental management measures are detailed in the following subsections.

8.1 Operational Management

8.1.1 Stockpiling

Scrap metal area provides stockpiling options for metals to facilitate future recycling. Scrap metal may include electrical cables, exotic and specialist alloys, drill rods and general metal waste. Scrap metal is stockpiled until sufficient volumes are generated so that economies of scale are obtained, and mobile plant can be brought on site to bale the materials. Stockpiles are to be keep as neat and tidy as practicable.

8.1.2 Material Processing

A metals re-processor shall periodically visit the site to bale and transport scrap metal off site for recycling once a viable volume of material has accumulated or when market conditions are favourable.

8.2 Environmental Engineering Controls

The environmental engineering controls for the Scrap Metal Stockpiling Area includes:

- Low permeability hardstand area with a 1:200 slope gradient (north east to south east); and
- Designated areas for storage and processing.

8.3 Environmental Management

The key environmental risk associated with the Scrap Metal Stockpiling Area is Noise.

The acceptance, material handling and processing of the scrap metal stockpiles has the potential to generate noise that could reduce amenity and impact operators. To mitigate environmental impacts from the C&D Recycling Facility, the following noise management measures will be implemented.

### Table 8-1: C&D Recycling Facility Environmental Management Measures

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Environmental Management Measures</th>
</tr>
</thead>
</table>
| Noise  | • Waste receival and the operation of equipment and machinery on site is restricted to operational hours only  
|        | • Vehicles are restricted to a maximum speed of 10km per hour (km/h) on unsealed roads and areas  
|        | • Noise reducing workplace procedures will be adopted such conservative material handling operations and tipping materials from the lowest height possible;  
|        | • White noise alarms to be installed in all vehicles and machinery; and  
|        | • All equipment, plant and machinery will be maintained in good working condition |
9 Liquid Waste Area

Following acceptance at the weighbridge, liquid waste tankers are directed to the Liquid Waste Area. The Liquid Waste Area is comprised of two main treatment areas, namely the Fixation Ponds and the Evaporation Ponds. The fixation ponds have been designed to accept and treat liquid wastes such as oils and industrial sludges. In addition, hazardous wastes that require treatment prior to disposal to landfill to ensure they meet Class IV waste criteria may also be treated in the fixation ponds. Sullage and waste water will also be accepted at the Site. These wastes are directed to the evaporation ponds in the Liquid Waste Area. The operational and environmental management measures are detailed in the following subsections.

9.1 Operational Management

9.1.1 Evaporation Ponds

Liquid wastes and waste water such as sullage are placed in the reception ponds to undergo a separation process to reduce the volume of waste through evaporation. Liquid waste tankers transfer sullage from the truck to the reception ponds via a pipe line.

The solid constituents of the waste settles in the ponds and the remaining liquid is gravity fed into an evaporation pond. Sunlight and oxygen naturally biodegrade the incoming organic matter and evaporation reducing the volume of liquid waste in the pond. The solid content is removed as required from the ponds and placed in the Class IV landfill, as required.

9.1.2 Fixation Ponds

Hazardous liquid waste such as industrial sludges cannot be disposed of to landfill and therefore require treatment prior to disposal. This material must undergo a fixation/immobilisation process to ensure the waste is stable and does not contribute to leachate levels within the landfill. The liquid waste is transferred into the ponds to undergo fixation with suitable mixing materials (such as mulch). A front end loader or similar vehicle is utilised to ensure that all materials are effectively mixed to generate a homogenous product. Following the completion of the fixation process the waste is tested to ensure it meets the relevant criteria prior to being removed from the pond and disposed to the Class IV landfill.

9.2 Environmental Engineering Controls

The environmental engineering controls for the Liquid Waste Area includes:

- Concrete hardstand and bunding area around the fixation and evaporation ponds to capture any spills and leaks;
- HDPE Lined perimeter drain to stop infiltration of hazardous liquids into soil and groundwater;
- Concrete lined fixation and receival ponds to provide a protection barrier to the surrounding environment;
Operational and Environmental Management Plan
Pilbara Regional Waste Management Facility
Shire of Ashburton

- HDPE lined evaporation pond to provide a protection barrier to the surrounding environment; and
- Storage and bunding of hazardous wastes in accordance with Australian Standard as 1940-2017.

9.3 Environmental Management

The key risks associated with the Liquid Waste Area are:

- Hazardous liquid spills and leaks
- Odour
- Health risks.

The Liquid Waste Area contains fixation ponds and evaporation ponds for the treatment of hazardous liquid wastes and sewerage (respectively). A range of hazardous liquid wastes will be accepted at the fixations ponds for treatment which presents the potential for spills and health risks. Odours will arise from the evaporation ponds due to the nature of the waste received and treatment process. The environmental management measures for the Liquid Waste Area are detailed in Table 9-1.

Table 9-1: Liquid Waste Area Environmental Management Measures

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Environmental Management Measures</th>
</tr>
</thead>
</table>
| Hazardous liquid spills and leaks | • Safe handling of hydrocarbons and hazardous materials in accordance with Australian Standard AS 1940-2017  
                                    • Regular maintenance and monitoring of liquid waste treatments systems to ensure equipment and processes are working efficiently  
                                    • Suitably sized spill kits to manage any small scale spills  
                                    • All site personnel are aware of the requirements for the appropriate handling of hazardous materials through site inductions and training |
| Odour                      | • Minimise disturbance to evaporation ponds or breaking of crusts that form on the surface  
                                    • Regular removal of residual solid waste material and disposal into the landfill  
                                    • Constant monitoring of odour emissions at the Liquid Waste Area and if significant odour emissions are identified, corrective measures are undertaken |
| Health Risk                | • All personnel are aware of the hazardous liquid wastes accepted at the facility  
                                    • All personnel must wear appropriate PPE when handling hazardous liquid wastes  
                                    • All personnel are trained to handle hazardous materials in accordance with Australian Standard as 1940-2017 |
10 Tyre Monocell

Tyres accepted at the PRWMF are sent to the Tyre Monocell for baling and burial. The operational and environmental management measures are detailed in the following subsections.

10.1 Operational Management

10.2 Stockpiling

Following acceptance at the weighbridge, tyres and rubber are brought to the monocell for stockpiling prior to baling. Tyres are to be stockpiled in accordance with the DFES ‘Guidance Note GN02 – bulk storage of rubber tyres including shredded and crumbled tyres.’ Tyres are to be stockpiled in neat piles no more than 3m in height with each stockpile no more than 10m x 10m (or a maximum of 100m²) and minimum separation of 2.5m between the base of each stockpile.

10.3 Baling

Tyres are baled in the baling shed to reduce the volume of materials and maximise the void space consumption within the monocell. When sufficient quantities are generated, tyres and rubber (if appropriate) are placed in the baling machine and compressed according to the machine guidelines. All personnel must wear appropriate PPE and be trained to operate the baling machine. Tie wires of a suitable diameter are used to hold the compressed bale together. The size of the completed bale is dependent on the tyres that are compressed however a typical tyre bale is approximately 1.33m (length) x 1.55m (width) x 0.8m (depth).

10.4 Burial

The monocell is excavated in sections on an as needed basis. Each cell is excavated to a maximum depth of 3m. A maximum of two bales in height are to be placed in the monocell. If materials are not baled, these will be placed in the monocell to a maximum depth of 2.5 metres. Cover material will be applied to a depth of approximately 0.5m. The surface of the cover material is graded to drain water from off the monocell.

10.5 Environmental Engineering Controls

The environmental engineering controls for the Tyre Monocell includes:

- Monocells are excavation of cells as required
- Maximum excavation of 3m to ensure a minimum separation distance of 1m to groundwater
- Side walls constructed to 1:2 slopes
- Elevated, compacted and graded edges to shed surface water away from the monocell
- Capped with 0.5m of suitable material
- Final capping graded and compacted to shed water.
10.6 Environmental Management

The key environmental risk associated with the Tyre Monocell is:

- Tyre fires

The storage of tyres can result in the risk of potential fires. Tyres fires are extremely difficult to extinguish due to their high calorific value which is approximately twice that of other common combustible material. Although tyres are generally not easily ignitable, management measures are required to minimise risk of tyre fires. The management measures to mitigate the risk of tyre fires is shown in Table 10-1.

Table 10-1: Tyre Monocell Environmental Management Measures

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Environmental Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Risk</td>
<td>- Stockpiles of unbaled tyres will be kept to maximum of 4 individual stacks will be grouped and kept to a maximum of 3 m high and a maximum area of 100m² and separated by a minimum of 2.5m</td>
</tr>
<tr>
<td></td>
<td>- Tyres will be baled as soon as quantities are sufficient</td>
</tr>
<tr>
<td></td>
<td>- Tyres will be buried as soon as volumes are sufficient for burial</td>
</tr>
<tr>
<td></td>
<td>- Progressive capping of the tyre monocell</td>
</tr>
</tbody>
</table>
11 Asbestos Monocell Operation

All accepted asbestos loads are disposed of the Asbestos Monocell. The following section details the operational details for the correct unloading, handling and disposal of asbestos which should be read in conjunction with the Asbestos Management Plan (Appendix A). The operational and environmental management measures are detailed in the following subsections.

11.1 Operational Management

11.1.1 Excavation of Monocell

The asbestos monocell shall be excavated progressively on an as needs basis. The monocell is excavated to a maximum of 4m deep. Sufficient space will be prepared on a daily basis so that any asbestos received can be buried immediately.

11.1.2 Unloading

The Site Operator must supervise the unloading and disposal off the asbestos materials and the customer must follow the directions of the Site Operator at all times. All vehicles and machinery must ensure internal air circulation is used and windows are closed on arrival at the tip face and exiting the facility. Asbestos must be unloaded using either a front end loader or excavator carefully to avoid damage to packaging and generating excessive dust. Asbestos loads with any damage to wrapping or exposed asbestos should be wet down prior to disposal. Loads should be dropped as close to the monocell as possible to minimise handling of the material and potential for damage to packaging to occur. All personnel are required to wear appropriate PPE when handling asbestos or outside vehicles during unloading.

11.1.3 Burial

An exclusion zone must be established during the disposal of asbestos and any untrained personnel must remain outside the exclusion zone. The Site Operator and/or Site Supervisor must witness the disposal and immediate covering of asbestos loads with suitable cover material at a minimum of 1m thickness. No direct compaction of asbestos is to occur, compaction is only to occur following application of cover material. The GPS location, type and quantity of each asbestos load should be recorded for all asbestos disposed. Following burial no disturbance to buried asbestos should occur. The final cap should be a minimum of 1m for non-friable asbestos and 3m for friable asbestos.

11.2 Environmental Engineering Controls

The environmental engineering controls for the Asbestos Monocell are:

- Monocells are excavated as required
- Maximum excavation of 4m to ensure a minimum separation distance of 1m to groundwater
- Side walls constructed to 1:2 slopes
- Elevated, compacted and graded edges to shed surface water away from the monocell
- Monocell is progressively capped
- Final capping graded and compacted to shed water
11.3 Environmental Management

The key environmental risks associated with the Asbestos Monocell are:

- Health risk from inhalation of asbestos
- Contamination of surrounding environment

The handling and disposal of asbestos within the monocell can present a serious health risks and contamination of the surrounding environment therefore appropriate management measures must be implemented.

11.3.1 Asbestos Management

The management measures for asbestos are detailed in the Asbestos Management Plan (Appendix B).
12 Class IV Landfill

The operational and environmental management measures for the landfill are detailed in the following subsections.

12.1 Operational Management

To ensure the Class IV landfill is operated effectively and efficiently, the following section outlines the requirements for the active tip face size, vehicle movements, unloading techniques, waste placement including compaction and cover requirements, disposal activities during adverse weather conditions and phasing of filling.

There are number of elements to consider for the successful management of the tip face. The implementation of these practices will ensure the standards of landfill operation is maintained whilst minimising the risk of any long term impacts. The key factors for ensuring effective tip face management include:

- Maintaining a small tip face/working face as far as practicable
- Organised vehicle movements
- Appropriate unloading techniques
- Inspection during unloading
- Correct waste placement/deposition
- Compaction of waste
- Daily covering of waste.

12.1.1 Tip Face Size

The optimum tip face is influenced by the volume of waste, traffic numbers and site equipment/machinery. Large tip faces can result in the poor control, greater expense, excessive consumption of void space, attraction of vermin, generation of litter and increased quantities of cover required. In accordance with Best Practice Landfill Standards, waste will be deposited at the active tipping face, which will be kept to a maximum of 30m by 30m width and up to 2m in height.

12.1.2 Vehicle Movements

All trucks entering the tipping area are to adhere to the designated speed limits of 10km and follow all signage and instructions of the Site Operator. There are not anticipated to be a high volume of vehicles accessing the tip face at any one time however, should multiple vehicles be in the tipping area at any one time they are to remain a minimum of 3m apart and must not be located within 3m of the tip face. Visual and radio communication should be maintained between vehicles and machinery at all times.

12.1.3 Unloading

Trucks can unload following instruction from the Site Operator. Unloading shall occur within 5m of the active tip face to minimise unnecessary handling. Unloading is undertaken at a suitable height to minimise the generation of dust, windblown waste and to maintain a tidy working area.
12.1.4 Inspection at Tip Face

All waste is inspected at the tip face by a Site Operator to ensure no unacceptable waste types are deposited in the landfill. The customer takes the waste collection vehicle to the unloading area, making sure the working area is safe and managing any hazards prior to disposal. The waste is visually inspected as it is deposited into the active cell.

In the event non-conforming waste is identified, the customer is asked to remove the non-conforming waste from the tip face. If the customer is no longer on site and cannot be identified the waste is removed and isolated. The Site Supervisor shall arrange for the collection of the non-conforming waste and appropriate treatment.

Where feasible, the Site Operator will endeavour to recovery materials from the landfill tip face such as scrap metal etc.

12.1.5 Water Bodies

The pooling of water within the tip face can cause traction issues for vehicles and may attract vermin. The Site Operator should endeavour to clear any such water bodies around the active tip face.

12.1.6 Waste Placement and Compaction

In general, the preferred method for the placement of waste is as follows:

- Tipping out the waste at the head of respective tipping areas
- Pushing wastes to the tip face using the compactor
- Spreading and compacting waste in 500mm lifts to form a 2.0m deep platform
- Development of a level platform across the cell until the other side is reached
- Repetition of this procedure until the pre-settlement final fill profile of the cell is reached.

At the end of each day, a 300mm layer of cover must be applied to the waste to:

- Prevent windblown litter
- Reduce pests such as rodents and birds
- Reduce stormwater ingress into the waste mass.

To maintain vehicular access to the tip-face it is essential that the waste compaction is kept as high as possible. If sufficient waste compaction is not achieved, it may be necessary to apply additional clean fill to allow access to the tip-face for the waste delivery vehicles. Bulky objects which are difficult to bury can be placed at the base of the tip face and then covered from above.
Diagram 5: Landfilling Methodology
The specific waste placement/deposition procedures for contaminated solid wastes and Type 2 special wastes are detailed below. All other waste types are to be placed in the landfill and covered as per the normal cover requirements detailed above.

### 12.1.6.1 Contaminated Solid Wastes

Contaminated soils and other contaminated solid wastes must be disposed to landfill in accordance with the following requirements:

- Waste loads must be covered/contained on arrival at the tip face
- Appropriate PPE must be worn by all personnel when outside vehicles
- Contaminated soils should be wet down prior to disposal
- Loads of contaminated soils should be deposited in a manner to reduce the generation of dust.

### 12.1.6.2 Type 2 Special Wastes (Clinical Waste)

Clinical waste must be disposed to landfill in accordance with the following requirements:

- Clinical waste must meet the pre-acceptance requirements
- Waste shall be deposited at the lowest edge of the landfill working face or excavation
- Waste shall be covered immediately with at least one metre of solid general waste or clean fill
- Only compaction of the cover is permitted (no compaction should occur directly on the waste)
- Burial of this waste shall be supervised
- The GPS location shall be recorded
- No clinical waste should be placed in the final lift and within two metres of the final surface.

### 12.1.7 Daily and Intermediate Cover

At the end of each day a layer of suitable cover material is progressively applied to exposed waste on the top of the cell and working faces. Cover material should be applied at a thickness of 300mm to meet Best Practice Landfill Standards for putrescible landfills. The covering of waste will assist with minimising odour, windblown litter, attraction of vermin, fire risk and general amenity. The Site Supervisor must ensure there are sufficient quantities of daily cover material available to cover the waste on a daily basis. The cover materials that can be used include materials excavated during the construction of the cells. Prior to further waste placement, the daily cover should be partially removed to avoid waste containment (EPA VIC, 2015).

Type 2 special waste (clinical waste) should be buried and covered immediately to align with the deposition requirements and Best Practice Landfill Standards.

Intermediate cover may be required for areas that are left for weeks or months until additional lifts are added. Intermediate cover shall be applied a thickness of 300mm however this may be greater depending on the materials deposited. The intermediate cover will assist in the reduction of rainfall infiltration and generation of litter.
The requirements of cover material at the facility will be obtained from the excavated surplus overburden soils.

### 12.1.8 Stability

The stability of the landfill is a key factor that can impact on the integrity of the landfill’s environmental controls. Loss of integrity to the landfill liner can result in environmental impacts such as contamination of groundwater and soils.

To ensure the stability of waste and to minimise short term settlement, waste should be levelled and compacted as soon as possible (excluding Type 1 and 2 special wastes). The aspects affecting compaction include the nature of waste material, weight of the compactor, number of passes and depth of layer/lift. Ideally no more than 0.5m of waste should be compacted at any time (EPA VIC, 2015). The Best Practice Landfill Standards suggest that three to five passes of the waste is undertaken to maximise compaction and minimise settlement.

The slope of the working face can impact on waste compaction, manoeuvrability, quantity of cover required and water drainage. All basal and side slopes of the landfill comply with Best Practice Landfill Standards. In accordance with Best Practice Landfill Standards, the final fill profile and slopes will be 1V:17H to:

- Ensure the long term stability and integrity of the capping material and containment layer;
- Promote the shedding of surface water from the landfill;
- Provide an aesthetically acceptable landform; and
- Minimise long term maintenance requirements.

### 12.1.9 First Layer of Waste

An access road should be established from the top to the bottom of the cell to the working face that ensures vehicles do not come into contact with the cell lining system. A sufficient turning area at the end of the access road should be established to allow for the manoeuvrability of machinery and trucks. No bulky or sharp waste should be placed in the first layer that may cause damage to the cell liner. The first layer should be approximately 0.5m to 1m depending on the waste type and should not be compacted.

### 12.1.10 Phasing of Filling

The filling of landfill cells will be undertaken in a phased approached. This will ensure leachate generation is minimised, and that progress capping of the landfill can be achieved.

### 12.1.11 Adverse Weather Conditions

During periods of high winds and heavy rainfall events, the placement of waste will cease until the Site Supervisor deems it safe and acceptable to recommence works. Adverse weather conditions can result in the generation of litter and dust as well as general safety issues.
12.2 Environmental Engineering Controls

The Class IV landfill is constructed with a double composite lining system and is constructed to Best Practice Landfill Standards. The landfill design, lining system and environmental engineering controls are detailed below:

- **Landfill design:**
  - The bottom of the leachate sump is 2.9 metres above the highest natural groundwater level recorded in the development area.
  - 1V:3H and 1V:4H side slopes to the basal gradients at not less than 3 per cent to the primary collection pipe run and at not less than 1 per cent towards the extraction sump, in accordance with Best Practice Landfill Standards.
  - The restoration profile is 1V:5H and 1V:17H final slopes to facilitate stable and free draining post closure profile.
  - Maximum height of the landfill pre-settlement profile ranges approximately from 16m to 17m above the natural ground level across the development area.

- **Landfill Lining System:**
  - Double composite lining system including geosynthetic clay liner (GCL), high density polyethylene (HDPE), cushion/protection geotextile, and drainage geocomposite leak detection layer between the composite liners.

- **Landfill Environmental Controls:**
  - Leachate collection and management system incorporating 300mm aggregate drainage layer and a primary and secondary collection pipe network and evaporation ponds. The evaporation ponds will include:
    - 2mm HDPE Geomembrane
    - Needle-punched GCL
    - 300mm engineered subgrade
    - 0.5m freeboard.
  - Gas collection system including gas wells, pipes and vents.
  - Surface water management system consisting of a levee embankment, drains, attenuation and evaporation ponds.

- **Landfill Capping System:**
  - Geosynthetic cap including linear low density polyethylene (LLDPE) and GCL (currently proposed); and
  - Restoration subsoils and top soil/growth medium.

The PRWMF incorporates these critical aspects and has, therefore, been designed to Best Practice Landfill Standards. Each element of the landfill design is described in the following sub sections.

12.2.1 Basal Lining System

The Class IV landfill comprises a double composite lining system consisting of a primary and a secondary HDPE/GCL liner with a leak detection layer between the composite liners. The primary lining system has direct contact with the leachate produced from the waste mass, while the secondary lining system is considered a failsafe in the event that the primary liner was to lose its...
The lining system is described below in ascending order from the base of the landfill to the uppermost layer onto which the waste is deposited.

**Secondary Lining System**

- **Layer 1: Engineered Attenuation Layer** - A minimum 500mm thick engineered attenuation layer sourced from onsite ‘Pindan Sand’ is constructed on the base and side slopes of the landfill to form an engineered attenuation layer above the naturally occurring in situ attenuation soils. The key purpose is to provide a level of natural attenuation and a suitable engineered surface for the placement of the geosynthetic lining system.
- **Layer 2: Geosynthetic Clay Liner (GCL)** – A low permeability GCL consisting of a layer of bentonite needle punched between two layers of geotextile, is installed in direct contact with the engineered attenuation layer as part of the secondary composite lining system.
- **Layer 3: 2.0mm High Density Polyethylene (HDPE)** – A 2.0mm HDPE geomembrane overlies the lower GCL as an artificial sealing liner to form the upper part of the secondary lining system. The HDPE liner is welded together to form a solid artificial barrier to allow the direction of leachate towards the leachate extraction point.
- **Layer 4: Drainage Geocomposite** – The drainage geocomposite acts as a Leak Detection Layer consisting of a fused geonet and geotextile to direct potential seepage to a secondary extraction/monitoring sump.

**Primary Lining System**

- **Layer 5: Geosynthetic Clay Liner (GCL)** – A low permeability Geosynthetic Clay Liner (GCL) consisting of a layer of bentonite needle punched between two layers of geotextile.
- **Layer 6: 2.0mm High Density Polyethylene (HDPE)** – A 2.0mm HDPE geomembrane acts as an artificial sealing liner to form the upper part of the primary lining system. The HDPE liner is welded together to form a solid artificial barrier to allow the direction of drains towards the leachate extraction point.
Layer 7: Cushion/Protection geotextile - The composite lining system is protected from the leachate collection system and overlying materials with a non-woven cushion/protection geotextile. The cushion/protection geotextile is specified to account for the grading of the gravel and long term loading from waste disposal operations.

Layer 8: Leachate Collection System - A 300mm thick layer of permeable gravel with an associated network of perforated collection pipes acts as the leachate collection system. The collection system directs leachate to the extraction point and subsequent removal and treatment within the evaporation ponds.

12.3 Environmental Management

The key environmental risks associated with the Class IV landfill are:

- Leachate
- Landfill gas
- Odour
- Litter
- Fire
- Feral animals and vermin.

Leachate may be generated through waste decomposition in the landfill, liquids within in the waste deposited, surface water inflow, groundwater intrusion, and the percolation of rainfall through waste. Leachate can infiltrate into the soil and groundwater causing contamination. There are a number of factors influencing the composition and characteristics of leachate. These factors may include rainfall, waste types, age of the waste, surface and groundwater ingress, compaction, cover, capping and rehabilitation.

The decomposition of the organic content within the waste stream results in the generation of methane, carbon dioxide and volatile organic compounds. Some of these gases contribute to the effects of climate change, produce an odour and may impact human health. Odours are generated through the decomposition of putrescible waste, from the generation of landfill gas and through the storage of leachate.

Due to the nature of the operation, landfills have the capacity to generate windblown waste which can result in both environmental and social impacts. Putrescible waste, voids and water bodies within the waste mass can attract vermin causing nuisance, risk of disease and ecological impacts. Subsurface fires can result in serious and adverse impacts to the engineering controls of a landfill including the landfill lining system, which if compromised, could result in contamination of groundwater from leachate seepage.

The management measures for leachate, landfill gas, odour, litter and feral animals and vermin are detailed in Table 12-1.
### Table 12-1: Landfill Environmental Management Measures

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Environmental Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leachate</strong></td>
<td>- Double composite lining system (Section 12.2.1)</td>
</tr>
<tr>
<td></td>
<td>- Leachate collection and extraction system (Section 12.2)</td>
</tr>
<tr>
<td></td>
<td>- Leak detection layer (Section 12.2)</td>
</tr>
<tr>
<td></td>
<td>- Leachate storage system (evaporation ponds) with 0.5m freeboard (Section 12.2)</td>
</tr>
<tr>
<td></td>
<td>- Recirculation of leachate during wet weather periods/events</td>
</tr>
<tr>
<td></td>
<td>- Phasing of landfill cells to minimise leachate generation</td>
</tr>
<tr>
<td></td>
<td>- Regular inspection, maintenance and repairs of leachate collection system</td>
</tr>
<tr>
<td></td>
<td>- Surface water management system to minimise the infiltration of surface water and generation of leachate:</td>
</tr>
<tr>
<td></td>
<td>- Swale system</td>
</tr>
<tr>
<td></td>
<td>- Attenuation pond</td>
</tr>
<tr>
<td></td>
<td>- Infiltration ponds x 2</td>
</tr>
<tr>
<td></td>
<td>- Levee embankment and rock armouring</td>
</tr>
<tr>
<td><strong>Landfill gas</strong></td>
<td>- Landfill gas management system:</td>
</tr>
<tr>
<td></td>
<td>- Vertical extraction wells</td>
</tr>
<tr>
<td></td>
<td>- Collection pipework</td>
</tr>
<tr>
<td></td>
<td>- Gas manifolds</td>
</tr>
<tr>
<td></td>
<td>- Condensate traps</td>
</tr>
<tr>
<td></td>
<td>- Flare and or aspirating cowl</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>- Daily covering of waste with 300mm of suitable material (Section 12.1.6)</td>
</tr>
<tr>
<td></td>
<td>- Daily compaction of waste material (Section 12.1.6)</td>
</tr>
<tr>
<td></td>
<td>- The Site Supervisor must ensure that adequate volumes of cleanfill are available to ensure waste is covered sufficiently on a daily basis or when required.</td>
</tr>
<tr>
<td></td>
<td>- Minimising the size of the active face (maximum of 30m x 30m)</td>
</tr>
<tr>
<td></td>
<td>- Installing intermediate/interim cover on active areas (excluding the active face)</td>
</tr>
<tr>
<td></td>
<td>- Progressive capping of complete cells as soon as practicable to minimise odour</td>
</tr>
<tr>
<td></td>
<td>- Landfill Gas Management System</td>
</tr>
<tr>
<td></td>
<td>- Leachate Collection System</td>
</tr>
<tr>
<td></td>
<td>- All waste collection vehicles carrying putrescible waste onsite will be required to be enclosed or covered</td>
</tr>
<tr>
<td></td>
<td>- Avoiding disturbance of previously placed waste</td>
</tr>
<tr>
<td></td>
<td>- Monitoring of odour</td>
</tr>
<tr>
<td><strong>Litter</strong></td>
<td>- Vehicles enter and exit the site via the sealed access road</td>
</tr>
<tr>
<td></td>
<td>- All waste collection vehicles are covered during transport to avoid materials escaping from vehicles during transport off and onsite</td>
</tr>
<tr>
<td></td>
<td>- Relocatable screens will be placed around the tipping area at a minimum height of 1.8m, where required</td>
</tr>
<tr>
<td>Aspect</td>
<td>Environmental Management Measures</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>• Site Operator should consider the direction of the wind and strength and guide all waste collection vehicles to a suitable area for tipping</td>
</tr>
<tr>
<td></td>
<td>• Complete discharge of waste loads during unloading</td>
</tr>
<tr>
<td></td>
<td>• Compaction of waste as soon as practicable (three to five passes over the waste layer to maximise compaction and minimise settlement)</td>
</tr>
<tr>
<td></td>
<td>• Daily covering of waste to a minimum depth of 300mm</td>
</tr>
<tr>
<td></td>
<td>• Site Supervisor must ensure adequate volumes of suitable cover material are available</td>
</tr>
<tr>
<td></td>
<td>• The tipping area is kept to Best Practice Landfill Standards</td>
</tr>
<tr>
<td></td>
<td>• Suitable fencing is installed around the perimeter of the facility</td>
</tr>
<tr>
<td></td>
<td>• Windblown waste within the facility and outside the facility will be collected on a regular basis</td>
</tr>
<tr>
<td></td>
<td>• All works and reception of waste cease during periods of strong winds (&gt;40km/h)</td>
</tr>
<tr>
<td></td>
<td>• Any litter located within the facility shall be collected on a weekly basis focusing on perimeter fencing, gates and litter screens</td>
</tr>
<tr>
<td></td>
<td>• In the event litter escapes the boundaries of the facility, litter shall be collected as soon as practicable</td>
</tr>
<tr>
<td></td>
<td>• Following the completion of each cell, capping will be installed progressively</td>
</tr>
<tr>
<td></td>
<td>• Good housekeeping must be encouraged throughout the lifespan of the facility</td>
</tr>
<tr>
<td></td>
<td>• All staff are instructed to maintain a tidy working area during inductions and training</td>
</tr>
<tr>
<td></td>
<td>• A complaints register is maintained for the reporting of any issues relating to litter</td>
</tr>
<tr>
<td>Fire</td>
<td>• All loads are inspected by infrared camera at the weighbridge</td>
</tr>
<tr>
<td></td>
<td>• Loads are inspected by the site operator during offloading at the tipping face</td>
</tr>
<tr>
<td></td>
<td>• Ignited loads are directed to a cleared area located near the water tanks for fire suppression</td>
</tr>
<tr>
<td></td>
<td>• Daily compaction and covering of waste will reduce the presence of voids within the waste mass thereby reducing the availability of oxygen</td>
</tr>
<tr>
<td></td>
<td>• All staff will undergo induction/training to recognise signs of surface and subsurface landfill fires.</td>
</tr>
<tr>
<td></td>
<td>• Further management of fire is detailed in Section 13</td>
</tr>
<tr>
<td>Feral animals and vermin</td>
<td>• Compaction of waste as soon as practicable (three to five passes over the waste layer)</td>
</tr>
<tr>
<td></td>
<td>• Daily covering of waste to a minimum depth of 300mm</td>
</tr>
<tr>
<td></td>
<td>• Further management of feral animals and vermin is detailed in Section 13</td>
</tr>
</tbody>
</table>
13 General Site Environmental Management

The following section details the general environmental management measures required across the site to manage potential impacts of feral animals and vermin, dust, surface water, waste water, weeds, fire, noise, traffic and hydrocarbons.

Table 13-1: General Site Environmental Management

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Environmental Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feral animals and vermin</td>
<td>• Installation of a 1.8m floppy top fence with 600mm overhang and skirt around the entire site boundary</td>
</tr>
<tr>
<td></td>
<td>• Concrete or metal base with the gap between the base and the gate as small as it practical (i.e. less than the wire gaps)</td>
</tr>
<tr>
<td></td>
<td>• Access gate is closed outside operational hours</td>
</tr>
<tr>
<td></td>
<td>• Weekly inspection and maintenance of the fence to control the ingress of feral animals (i.e. cats and foxes)</td>
</tr>
<tr>
<td></td>
<td>• Feral and pest species will endeavour to enter the facility via the access gate (when open) therefore, gatehouse staff can maintain keen observation to prevent this from happening. When it does occur, the animal is recorded in the register. The Site Manager is notified so immediate action can be taken to remove the pest species.</td>
</tr>
<tr>
<td></td>
<td>• Progressive compaction of waste</td>
</tr>
<tr>
<td></td>
<td>• Daily and intermediate cover of waste to a minimum of 300mm (Section 12.1.7)</td>
</tr>
<tr>
<td></td>
<td>• Regular inspection and maintenance of the cover material to ensure no waste is exposed</td>
</tr>
<tr>
<td></td>
<td>• Ongoing monitoring of feral animals and vermin (Section 14.7)</td>
</tr>
<tr>
<td></td>
<td>• A qualified pest control contractor will be engaged to implement appropriate control methods (trapping, baiting, shoot feral and pest species, and hand catch and relocate native fauna)</td>
</tr>
<tr>
<td></td>
<td>• Induction/training to include feral animal and pest identification, controls and management measures:</td>
</tr>
<tr>
<td></td>
<td>o explain the importance of stopping and eradicating feral and pest species becoming established and the generalised invasion curve;</td>
</tr>
<tr>
<td></td>
<td>o explain the register of feral and pest species, what information is included in the register, when information is added, by whom and how the data will be used</td>
</tr>
<tr>
<td></td>
<td>o indicate to all staff that feral and native fauna will not be fed on-site nor will containers for water provided for feral and pest species to access</td>
</tr>
<tr>
<td></td>
<td>o reporting all interactions between feral and pest species and staff and visitors</td>
</tr>
<tr>
<td></td>
<td>• The PRWMF will establish and maintain a register of all feral and pest species recorded on-site. The register include the following information:</td>
</tr>
</tbody>
</table>

Feral animals and vermin

The PRWMF will establish and maintain a register of all feral and pest species recorded on-site. The register include the following information:
## Aspect | Environmental Management Measures
--- | ---
| **Operational and Environmental Management Plan** |  
**Pilbara Regional Waste Management Facility**  
**Shire of Ashburton**
| **Operational and Environmental Management Plan** |  
**Pilbara Regional Waste Management Facility**  
**Shire of Ashburton**

### Environmental Management Measures
- o name of species
- o location of recording
- o date and time of recording
- o number of individuals
- o evidence of feral or pest species (e.g. animal, scat, burrow, call, etc)
- o description of what they were doing (e.g. feeding, digging, in a burrow, drinking, predating on small birds, etc)
- o other comments (i.e. colour patterns, general health); and who made the observation

### Dust
- Daily visual observations of dust levels at the site
- Vehicles will be restricted to a maximum speed of 10km/h on unsealed roads
- Vehicles will enter and exit the facility via the sealed access road
- All waste loads will be covered at all times during transport to the site and also while on site
- During operational and closure activities, a 10,000L all-wheel drive water cart will be used to suppress dust when necessary
- All works and receipt of waste will cease during periods of strong winds (>40km/h)
- Equipment will be used in a manner to minimise dust
- Additional long term management measures may be implemented such as the installation of chemical crusting agents, hydro seeding or mulching, if required

### Surface water
- Stormwater within the site will be diverted to drains and attenuation ponds to minimise impacts to surface water flows and allow for the controlled release to the surrounding environment
- Any litter or foreign matter within the surface water collection system and ponds is to be removed as part of the general litter collection activities. Regular inspection and maintenance of the surface water management infrastructure including the flood levee to be undertaken
- Regularly sampling of the surface water ponds to be undertaken (Section 14.4)
- Any surface water that comes into contact with waste within the landfill cells will be collected and treated to ensure contaminated surface water is not released into the surrounding environment
- Any ponding within the surface depressions along the sand ridge northeast of the landfill development footprint will be managed via a mobile pump when necessary

### Weeds
- Vehicles entering the site are free of soil, mud and vegetative material
- Use of wheel wash to remove any potential introduced flora plants or seeds
- Awareness of weed management through the site induction. The site induction will include information pertaining to weeds occurring at the site as
<table>
<thead>
<tr>
<th>Aspect</th>
<th>Environmental Management Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>well as the hygiene and reporting requirements associated with weed management.</td>
</tr>
<tr>
<td></td>
<td>• Vehicles to adhere to established roads and tracks to prevent the spread of weeds within the site</td>
</tr>
<tr>
<td></td>
<td>• All green waste loads to be covered until unloading at Green Waste Processing Facility</td>
</tr>
<tr>
<td></td>
<td>• Manual removal or application of appropriate chemicals prior to flowering periods.</td>
</tr>
<tr>
<td></td>
<td>• Regular monitoring of weeds across the site to be undertaken by all site staff (Section 14.8)</td>
</tr>
<tr>
<td>Fire</td>
<td>• An asset protection zone of 10m will be maintained around the facility</td>
</tr>
<tr>
<td></td>
<td>• Clear area/zone within reach of a firefighting water supply system for unloading/parking and managing a potential fire within an incoming transportation vehicle</td>
</tr>
<tr>
<td></td>
<td>• Maintenance of fire breaks will be undertaken when necessary to ensure the area remains clear</td>
</tr>
<tr>
<td></td>
<td>• Manage and maintain the PRWMF Site in a ‘low bushfire threat state’</td>
</tr>
<tr>
<td></td>
<td>• Regular inspection and maintenance of relevant fire controls including:</td>
</tr>
<tr>
<td></td>
<td>o fire breaks around roads and infrastructure</td>
</tr>
<tr>
<td></td>
<td>o bushfire Control Access Road around the perimeter of the site</td>
</tr>
<tr>
<td></td>
<td>o 100,000L water tank (or two 50,000L)</td>
</tr>
<tr>
<td></td>
<td>• Utilisation of a 10,000L all-wheel-drive water tanker at the site;</td>
</tr>
<tr>
<td></td>
<td>• All fire extinguishers will be kept in visible safe locations and regularly tested.</td>
</tr>
<tr>
<td></td>
<td>• Ensure adequate water supply is available for fire suppression on a daily basis</td>
</tr>
<tr>
<td></td>
<td>• Establish muster points</td>
</tr>
<tr>
<td></td>
<td>• All staff will be trained in the operation of firefighting equipment, fire control and emergency procedures</td>
</tr>
<tr>
<td></td>
<td>• Regular testing of all firefighting equipment</td>
</tr>
<tr>
<td></td>
<td>• Install fire suppression equipment in all vehicles and machinery</td>
</tr>
<tr>
<td></td>
<td>• Vehicle and machinery will be regularly maintained to ensure the safe and efficient operation and minimise the potential for any electrical faults that may result in fires</td>
</tr>
<tr>
<td></td>
<td>• Monitoring of fire risks (Section 15.5)</td>
</tr>
<tr>
<td>Noise</td>
<td>• Operations are restricted to the hours of 6am to 5pm Monday to Sunday.</td>
</tr>
<tr>
<td></td>
<td>• Vehicles will be restricted to a maximum speed of 10 km per hour on unsealed roads (km/hr)</td>
</tr>
<tr>
<td></td>
<td>• White noise reversing alarms will be fitted to all vehicles. These alarms produce a clear audible sound that has multi frequencies and is directional and therefore reduces noise nuisance</td>
</tr>
<tr>
<td></td>
<td>• All equipment and machinery will be fitted with exhaust silencers and</td>
</tr>
<tr>
<td>Aspect</td>
<td>Environmental Management Measures</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>acoustic panels to minimise noise emissions</td>
</tr>
<tr>
<td></td>
<td>• Regular maintenance will be undertaken to ensure equipment and machinery are running efficiently and no unusual or unexpected noise emissions are generated.</td>
</tr>
<tr>
<td></td>
<td>• Personnel will wear appropriate PPE when near or operating noisy plant or machinery for extended periods</td>
</tr>
<tr>
<td></td>
<td>• Compliance with Environmental Protection Act 1986 and Environmental Protection (Noise) Regulations 1997</td>
</tr>
<tr>
<td></td>
<td>• Complaints register will be maintained to deal with noise complaints</td>
</tr>
<tr>
<td>Traffic</td>
<td>• All vehicles to maintain a maximum speed of 10 km/hr on unsealed roads</td>
</tr>
<tr>
<td></td>
<td>• Clear signage placed strategically located around the facility to ensure all drivers are aware of speed limits, directions and locations of infrastructure</td>
</tr>
<tr>
<td></td>
<td>• Vehicles and machinery must move through the site via established roads and tracks only</td>
</tr>
<tr>
<td></td>
<td>• Employees and contractors shall wear high visibility and reflective clothing when working in areas where vehicle movement occurs</td>
</tr>
<tr>
<td></td>
<td>• All site vehicles and machinery to undergo regular maintenance</td>
</tr>
<tr>
<td></td>
<td>• All staff and visitors to the facility are inducted to ensure all personnel are aware of the traffic rules</td>
</tr>
<tr>
<td></td>
<td>• Employees and contractors shall wear high visibility and reflective clothing when working in areas where vehicle movement occurs</td>
</tr>
<tr>
<td>Waste Water</td>
<td>• Wheel Wash and Wash Down Bay:</td>
</tr>
<tr>
<td></td>
<td>o Hydrocarbon contaminated water from the wheel wash and washdown bay is captured in a sump and transferred to the oily water separator system for treatment</td>
</tr>
<tr>
<td></td>
<td>o An adequate freeboard is maintained to ensure the sump does not overflow during heavy rainfall events</td>
</tr>
<tr>
<td></td>
<td>o Sediment is collected from the sump on a regular basis and disposed of in the landfill</td>
</tr>
<tr>
<td></td>
<td>o Treated waste water is discharged or used for dust suppression</td>
</tr>
<tr>
<td></td>
<td>• Regular sampling of treated water is undertaken to ensure it meets the discharge criteria</td>
</tr>
<tr>
<td></td>
<td>• Ablutions:</td>
</tr>
<tr>
<td></td>
<td>o Waste water and septage from the ablation facilities is directed to a storage tank and then transferred to the evaporation pond in the Liquid Waste Area for treatment</td>
</tr>
<tr>
<td></td>
<td>o Regular monitoring of the system and storage tank levels is undertaken to ensure the system is working effectively and there is no risk of overflows</td>
</tr>
<tr>
<td></td>
<td>• Crib Rooms:</td>
</tr>
<tr>
<td></td>
<td>o All waste water from the office/crib rooms is sent to the evaporation</td>
</tr>
</tbody>
</table>
## Environmental Management Measures

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Measures</th>
</tr>
</thead>
</table>
| Hydrocarbons | • Storage and handling of fuel is undertaken in accordance with Standards Australia AS 1940:2017 ‘The storage and handling of flammable and combustible liquids’ and Australian Institute of Petroleum ‘Guidelines for Safe Above Ground Fuel Storage on Farms and Industrial Sites’ (AIP Guideline)  
• Hydrocarbon contaminated materials generated from maintenance activities (i.e. oily rags, contaminated containers etc.) are kept in suitable receptacles prior to disposal in the landfill  
• The fuelling bay is constructed to best industry standards includes a concrete hardstand, bunding and sump to capture any spills and contaminated surface water  
• The water from the fuelling bay is directed the oil water separator for treatment  
• Spill response kits of a suitable size are placed in/nearby appropriate locations around the site. Spill kits can vary but in general should contain:  
  o Fluid specific absorbent pads  
  o Spill containment booms  
  o General purpose absorbent pads  
  o Personal protection equipment  
  o Contaminated waste bags and ties  
  o Adhesive wall locator  
  o Laminated instruction sheets  
• Regular maintenance of equipment, machinery, bunding and hardstand areas  
• All staff are aware of the requirements for hydrocarbon management |
14 Environmental Monitoring and Sampling

To ensure environmental impacts are mitigated and the facility meets licence requirements, regular environmental monitoring and sampling is required. The details of the monitoring and sampling required are prescribed in the following subsections. The environmental aspects requiring monitoring and sampling include leachate, landfill gas, surface water, groundwater, feral animals and vermin and weeds.

14.1 General Monitoring and Sampling Requirements

14.1.1 Preparation

In general the preparation requirements for monitoring/sampling are as follows:

- Determine the number of samples required and the analytical parameters
- Determine the various equipment requirements (such as size, type and number of bottles required for sampling and any fixative or preservative requirements etc)
- Ensure all equipment is clean and in good working order
- Ensure all equipment is calibrated
- Ensure all necessary equipment and PPE is available to undertake monitoring

14.1.2 Data Recording

At each sampling event, data must be recorded which in general includes the following:

- Date
- Sampling/monitoring locations/ID’s
- Number of samples
- Name of field technician
- Equipment used
- Observations including
  - Weather conditions
  - Any damage to infrastructure.

14.1.3 Sampling Process

The specific sampling process varies for each environmental aspect however, in general the sampling process is:

- Sample bottles/containers should be filled completely to avoid the inclusion of air in the sample or to the ‘fill-to’ line.
- All samples bottles/containers should be labelled and field sheets completed
- Samples should be stored on ice or similar, kept out of direct sunlight (where possible) and sent to the laboratory on the same day or as specified by the laboratory
- All water samples are collected and preserved in accordance with AS/NZS 5667.1
- A chain of custody form should be completed for all samples and included with the samples.
The relevant sampling guidance document is provided under ‘sampling process’ for each environmental aspect requiring sampling.

14.1.4 Frequency

The frequency of sampling/monitoring is specified within the licence (insert licence number). In general the requirements for monitoring are:

- monthly monitoring is undertaken at least 15 days apart
- six monthly monitoring is undertaken at least 5 months apart
- annual monitoring is undertaken at least 9 months apart.

14.1.5 Laboratory Testing

All laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured.

14.1.6 Contingency

In the event the any of the relevant sampling criteria listed within the Licence are exceeded, the following actions must be undertaken:

- Report the exceedance to the Site Supervisor and any other relevant party
- Visually inspect the site infrastructure for damage and potential emissions, leaks, etc
- Repeat sampling and analysis
- Review monitoring data against trigger levels and previous results
- Undertake a risk assessment and determine appropriate course of action.

14.1.7 Reporting

In the event, of exceedance or exceedances to the Licence conditions, these are to be reported via an incident/hazard report form and sent to the Shire’s Waste Services Manager within 24 hours. If the breach requires reporting to the relevant government agency, the Shire’s Waste Services Manager.

14.2 Leachate Sampling

Leachate sampling is required to understand the composition of the leachate generated in the landfill. The locations, frequency, parameters, exceedance criteria, contingency and reporting are detailed below.

14.2.1 Sampling locations

Leachate sampling is undertaken at the leachate evaporation ponds are shown in the Site Licence (Appendix A).

14.2.2 Sampling Frequency and Parameters

The proposed parameters and monitoring frequency for leachate is outlined in Table 14-1.
Table 14-1: Leachate Sampling Parameters and Frequency

<table>
<thead>
<tr>
<th>Monitoring Point</th>
<th>Frequency</th>
<th>Measurement and Analytical Suite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leachate sample collected from the sump of each hydraulically separate cell.</td>
<td>Monthly</td>
<td>Leachate level and volume removed</td>
</tr>
<tr>
<td></td>
<td>Quarterly</td>
<td>pH, DO; EC; temperature (°C); redox potential (mV); total and dissolved metals#; TRH, BTEX; Nutrients^; TSS; Major anions and cations^; BOD and COD.</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td><em>As above but expanded to include:</em> Organic Acid; PCB; MTBE; CHC; PFAS; PAH; Phenols; OC and OP Pesticides; Microbial pathogens (E.Coli and Enterococci).</td>
</tr>
</tbody>
</table>

\# Metals include: Arsenic, cadmium, chromium (III and VI), copper, iron, lead, manganese, molybdenum, nickel and zinc.

\+ Major anions and cations include: Calcium, potassium, magnesium, sodium, hardness, hydroxide, carbonate, bicarbonate, Total Alkalinity, chloride, sulphate

^ Nutrients including: Nitrate-nitrogen, ammonia, ammoniacal nitrogen, reactive phosphorous, total nitrogen and total kjeldahl nitrogen

14.2.3 Exceedance Criteria

The exceedance criteria for leachate is shown in Table 14-2.

Table 14-2: Leachate Exceedance Criteria Levels

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Control Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammoniacal Nitrogen (as N)</td>
<td>0.18</td>
</tr>
<tr>
<td>Nitrate</td>
<td>14.8</td>
</tr>
<tr>
<td>Nitrite</td>
<td>0.48</td>
</tr>
<tr>
<td>Calcium</td>
<td>100</td>
</tr>
<tr>
<td>Chloride</td>
<td>1,060</td>
</tr>
<tr>
<td>Sodium</td>
<td>426</td>
</tr>
<tr>
<td>Potassium</td>
<td>81</td>
</tr>
<tr>
<td>Sulphate</td>
<td>158</td>
</tr>
<tr>
<td>Arsenic</td>
<td>0.005</td>
</tr>
<tr>
<td>Cadmium</td>
<td>No detect</td>
</tr>
<tr>
<td>Copper</td>
<td>0.048</td>
</tr>
<tr>
<td>Lead</td>
<td>0.002</td>
</tr>
<tr>
<td>Manganese</td>
<td>0.232</td>
</tr>
<tr>
<td>Mercury</td>
<td>No detect</td>
</tr>
<tr>
<td>Nickel</td>
<td>0.01</td>
</tr>
<tr>
<td>Zinc</td>
<td>0.08</td>
</tr>
<tr>
<td>Analyte</td>
<td>Control Level</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Benzene</td>
<td>No detect</td>
</tr>
<tr>
<td>Toluene</td>
<td>No detect</td>
</tr>
<tr>
<td>Xylene</td>
<td>No detect</td>
</tr>
</tbody>
</table>

The level triggers for leachate are outlined in Table 14-3.

### Table 14-3: Leachate Level Trigger Criteria

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Trigger level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leachate Head within the Leachate sump</td>
<td>0.3 – 1m</td>
</tr>
<tr>
<td>Leachate Pond A freeboard</td>
<td>0.5m</td>
</tr>
<tr>
<td>Leachate Pond B freeboard</td>
<td>0.5m</td>
</tr>
</tbody>
</table>

### 14.3 Landfill Gas Monitoring

Landfill gas may accumulate in buildings, structures as well as service trenches. Therefore, the objective of the monitoring is to measure for the build-up of methane in these areas to protect human health.

#### 14.3.1 Monitoring locations

The gas monitoring well locations as shown within the Site Licence (Appendix A).

#### 14.3.2 Monitoring Frequency

The proposed location, frequency and responsibility for landfill gas sampling are shown in Table 14-4. Landfill gas sampling requirements will be refined as per the DWER’s requirements.

### Table 14-4: Landfill Gas

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Monitoring Method</th>
<th>Monitoring Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfill Gas</td>
<td>Landfill gas bores</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td>Surface emissions</td>
<td>Annually*</td>
</tr>
<tr>
<td></td>
<td>Accumulation</td>
<td>Annually</td>
</tr>
</tbody>
</table>

*Once the temporary and/or final cap has been established.

#### 14.3.3 Monitoring Process – Landfill Gas Monitoring Bores

Landfill gas monitoring is undertaken using a calibrated handheld landfill gas meter (i.e. GA5000 or similar) in accordance with the manufacturer’s instructions. The daily atmospheric pressure is recorded prior to the initiation of monitoring. Once on Site a ‘clear air run’ should be performed to ensure equipment is running and to record atmospheric conditions.

To undertake monitoring at each well, the pressure and bore flow will be initially monitored. Following this, the wells are monitored for a period of approximately 5 minutes until concentrations of carbon dioxide, oxygen, methane and hydrogen sulphide stabilise, with gas concentrations...
recorded at 1 minute intervals. The following information is required to be recorded during each landfill gas monitoring event:

- Concentrations of landfill gas components
- Pressure of gas
- Gas flow
- Atmospheric pressure and rate of change
- Ambient temperature
- Date, time, site details, sample location
- Weather conditions and recent weather
- Condition of monitoring point
- Ground conditions.

14.3.4 Monitoring Process - Surface Emissions

Surface emissions are monitored across the landfill surface at as per Landfill gas fugitive emissions monitoring guideline, VEPA, 2018 (VEPA, 2018). Utilizing an Inspectra Laser, or similar, methane concentrations are recorded at 25m transects, with two sets completed at 90° angles to each other, resulting in a ‘grid’ pattern across the Site. The probe from the Inspectra Laser is positioned 50mm above the cap surface at each monitoring point. The following information is required to be recorded during each landfill gas monitoring event:

- Concentrations of methane;
- Atmospheric pressure and rate of change;
- Ambient temperature;
- Date, time, site details, sample location;
- Weather conditions and recent weather; and
- Ground conditions.

14.3.5 Monitoring Process - Landfill Gas Accumulation

Landfill gas may accumulate in buildings, structures as well as service trenches. Therefore, the objective of the monitoring is to measure for the build-up of methane in these areas to protect human health.

14.3.5.1 Accumulation Monitoring Procedure

The monitoring of buildings/services/trenches will be undertaken utilising an Inspectra Laser, or similar, in accordance with the manufactures specifications. Methane concentrations will be monitored by inserting the Inspectra Laser probe at 10mm to 30mm depth into the services/trenches, and within cupboards or closed areas where gas may accumulate within buildings. The following information is required to be recorded during each landfill gas monitoring event, where applicable:

- Concentrations of methane
- Atmospheric pressure and rate of change
- Ambient temperature
- Date, time, site details, sample location
- Weather conditions and recent weather
- Condition of monitoring point
- Ground conditions.

14.3.6 Exceedance Criteria

The exceedance criteria for landfill gas is shown in Table 14-5.

Table 14-5: Landfill Gas Exceedance Criteria

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Parameter</th>
<th>Action Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landfill surface final cap</td>
<td>Methane concentrations</td>
<td>100 parts per million (ppm)</td>
</tr>
<tr>
<td>Within 50 mm of penetrations through the final cap</td>
<td>Methane concentrations</td>
<td>100 ppm</td>
</tr>
<tr>
<td>Landfill surface intermediate cover areas</td>
<td>Methane concentrations</td>
<td>200 ppm</td>
</tr>
<tr>
<td>Within 50 mm penetrations through the intermediate cover</td>
<td>Methane concentrations</td>
<td>1,000 ppm</td>
</tr>
<tr>
<td>Subsurface geology at the landfill boundary</td>
<td>Methane concentrations</td>
<td>1% v/v above background</td>
</tr>
<tr>
<td></td>
<td>Carbon Dioxide concentrations</td>
<td>1.5% v/v above background</td>
</tr>
<tr>
<td>Subsurface services on or adjacent to the Site</td>
<td>Methane concentrations</td>
<td>10,000 ppm</td>
</tr>
<tr>
<td>Building/structures on and adjacent to the landfill Site</td>
<td>Methane concentrations</td>
<td>5,000 ppm</td>
</tr>
<tr>
<td>Landfill gas flares*</td>
<td>Methane and Volatile Organic Compounds concentrations</td>
<td>98% destruction efficiency</td>
</tr>
</tbody>
</table>

*If volumes become sufficient to support a flare

Where landfill trigger levels are exceeded, the DWER will be notified within 24 hours unless the issue has been rectified beforehand. Remedial action will be undertaken and, in order to demonstrate the effectiveness of the remediation strategy, a further monitoring round will be required once remediation has been completed.

14.3.7 Contingency Actions

Where landfill gas trigger levels are exceeded, the DWER will be notified within 24 hours unless the issue has been rectified beforehand. Remedial action will be undertaken and, in order to
demonstrate the effectiveness of the remediation strategy, a further monitoring round will be required once remediation has been completed. The remedial strategies are proposed as contingency measures in the event that landfill gas exceeds the relevant trigger levels.

14.3.7.1 Subsurface Gas Emissions

If it is demonstrated that landfill gases are laterally migrating, the extent of lateral migration will be established through increased monitoring frequency and/or through the installation of additional landfill gas monitoring bores (should they be required). If the adopted trigger levels are exceeded, the remedial/contingency actions may include:

- Confirm background levels
- Increase monitoring frequency
- Investigate the source of landfill gas
- Advise the DWER and staff
- Install additional landfill gas extraction wells at the source
- Installation of subsurface extraction drains.

14.3.7.2 Surface Gas Emissions

If the adopted trigger levels are exceeded, the remedial/contingency actions may include:

- Investigate the source of the landfill gas surface emission
- Repair or replace the cover material or landfill cap material
- Make sure that surface erosion control methods, such as the jute matting, is in place and subsequent vegetation cover is well established across the surface
- Adjust or install gas venting/extraction equipment
- Installation of perimeter gas collection trenches
- Evaluate the effectiveness of the gas collection system.

14.3.7.3 Accumulation

If the trigger levels inside structures/buildings are exceeded, evacuation of the suspect building should be immediate, followed with notification emergency services. The DWER and other relevant regulatory bodies should also be notified. Daily testing will then be undertaken until the implemented control measures are shown to be effective. These control measure may include:

- Improve ventilation within the structures/buildings
- Improve the landfill gas extraction infrastructure
- Increase monitoring frequency
- Identify and remediate the nearby sources of the landfill gas
- Evaluate the effectiveness of the landfill gas extractions system-if being used.

14.4 Surface Water Sampling

Surface water sampling is required ensure the surface water management system infrastructure is maintained, working effectively and surface water released into the surrounding environment meets
relevant standards. The sampling locations, frequency and parameters, exceedance criteria, contingency and reporting for surface water management are outlined below.

### 14.4.1 Sampling Frequency and Parameters

The proposed frequency of surface water sampling and the parameters requiring testing are shown in Table 14-6.

#### Table 14-6: Surface Water Sampling Requirements

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>None</td>
<td>Monthly or as required</td>
</tr>
<tr>
<td>Electrical Conductivity</td>
<td>μS/cm</td>
<td></td>
</tr>
<tr>
<td>Metals: Arsenic (total), cadmium, chromium, copper, iron (total), lead, manganese, mercury, molybdenum, nickel, selenium, zinc</td>
<td>mg/l</td>
<td></td>
</tr>
<tr>
<td>Nutrients: Ammoniacal nitrogen, nitrate-nitrogen, total nitrogen, total phosphorus</td>
<td>mg/l</td>
<td></td>
</tr>
<tr>
<td>Cations and anions: Total potassium, chloride and sulfate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total soluble solids, total organic carbon and chemical oxygen demand</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 14.4.2 Sampling location

Surface water samples are to be taken from the surface water attenuation pond. The location of the pond is shown in the Site Licence. Samples should be taken at varying depths within the surface water attenuation pond (i.e. surface, mid and bottom samples) when available.

#### 14.4.3 Sampling Process

All surface water sampling is to be conducted in accordance with AS/NZS 5667.4 and water samples are to be collected and preserved in accordance with AS/NZS 5667.1.

#### 14.4.4 Exceedance Criteria

Water quality must not exceed the surface water criteria listed in the ‘Australian and New Zealand Guidelines for Fresh and Marine Water Quality Volume 1’ (ARMCANZ and ANZECC, 2000).

### 14.5 Groundwater Monitoring and Sampling

Groundwater monitoring and sampling is required to identify any changes to its characteristics in the event a leak/seepage occurs from the landfill or other containment infrastructure on site and to ensure a sufficient response time if leachate extraction is required. Groundwater monitoring and sampling should be undertaken in accordance with licence requirements. Information on the groundwater bores are shown in Table 14-7.
### Table 14-7: Groundwater Bores

<table>
<thead>
<tr>
<th>Monitoring bore ID</th>
<th>Easting</th>
<th>Northing</th>
<th>TOC Elevation (AHD)</th>
<th>Ground level Elevation (AHD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH01</td>
<td>318256.150</td>
<td>7575786.900</td>
<td>19.242</td>
<td>18.739</td>
</tr>
<tr>
<td>BH02</td>
<td>317813.234</td>
<td>7575498.556</td>
<td>21.532</td>
<td>20.937</td>
</tr>
<tr>
<td>BH03</td>
<td>317274.685</td>
<td>7574345.443</td>
<td>17.248</td>
<td>16.734</td>
</tr>
<tr>
<td>BH04</td>
<td>315090.893</td>
<td>7576876.191</td>
<td>13.305</td>
<td>12.758</td>
</tr>
<tr>
<td>BH05</td>
<td>314916.308</td>
<td>7576694.188</td>
<td>13.076</td>
<td>12.524</td>
</tr>
<tr>
<td>BH06</td>
<td>316539.783</td>
<td>7576142.138</td>
<td>27.322</td>
<td>26.708</td>
</tr>
<tr>
<td>BH07</td>
<td>317331.367</td>
<td>7575420.705</td>
<td>17.671</td>
<td>17.150</td>
</tr>
<tr>
<td>BH08</td>
<td>316721.742</td>
<td>7575920.412</td>
<td>16.353</td>
<td>15.784</td>
</tr>
<tr>
<td>BH09</td>
<td>316354.224</td>
<td>7576209.023</td>
<td>16.781</td>
<td>16.257</td>
</tr>
<tr>
<td>BH10</td>
<td>316023.468</td>
<td>7575888.030</td>
<td>14.992</td>
<td>14.376</td>
</tr>
<tr>
<td>BH11</td>
<td>316519.834</td>
<td>7575494.496</td>
<td>16.188</td>
<td>15.629</td>
</tr>
<tr>
<td>BH12</td>
<td>316999.449</td>
<td>7575240.647</td>
<td>17.443</td>
<td>16.822</td>
</tr>
</tbody>
</table>

### 14.5.1 Sampling

#### 14.5.1.1 Sampling Locations

A total of 5 bores (BH01, BH02, BH03, BH17, BH012) are located up gradient of the landfill cell and 6 (BH 04, BH05, BH11, BH13, BH14, BH15), are located down gradient of the landfill development footprint. The location of the bores are shown in the Site Licence (Appendix A).

#### 14.5.1.2 Sampling Frequency and Parameters

The parameters requiring testing and their frequencies will be undertaken in accordance with Table 14-8 or licence conditions.

### Table 14-8: Groundwater Parameters and Frequency

<table>
<thead>
<tr>
<th>Monitoring Point</th>
<th>Frequency</th>
<th>Measurement and Analytical Suite</th>
</tr>
</thead>
<tbody>
<tr>
<td>All bores</td>
<td>Monthly</td>
<td>Groundwater depth (m AHD)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pH, dissolved oxygen (DO); electrical conductivity (EC); temperature (°C); redox potential (mV); total and dissolved metals#;TRH, BTEX; Nutrients^;TDS and Total suspended Solids (TSS); Major anions and cations; Biological and Chemical oxygen demand (BOD and COD).</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>As above but expanded to include: Organic Acid; Polychlorinated Biphenyls (PCB); Methyl tert-butyl ether (MTBE); Chlorinated Hydrocarbons (CHC); Per and Polyfluoroalkyl substances (PFAS), PAH; Phenols; Organochlorine</td>
</tr>
</tbody>
</table>
### Operational and Environmental Management Plan

**Pilbara Regional Waste Management Facility**  
Shire of Ashburton

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**Monitoring Point** | **Frequency** | **Measurement and Analytical Suite**  
--- | --- | ---  
 |  | (OC) and Organophosphate (OP) Pesticides; Microbial pathogens (E.Coli and Enterococci).  

+ Major anions and cations include: Calcium, potassium, magnesium, sodium, hardness, hydroxide, carbonate, bicarbonate, total alkalinity, chloride, sulphate  
# Metals include: Arsenic, cadmium, chromium (III and VI), copper, Iron, Lead, manganese, molybdenum, nickel and zinc.  
^ Nutrients including: Nitrate-nitrogen, ammonia, ammoniacal nitrogen, reactive phosphorus, total nitrogen and total kjeldahl nitrogen.

#### 14.5.1.3 Sampling Process

At each sampling location the technician is to take the required number of samples to test the parameters as outlined in Table 14-8. Groundwater sampling is to be conducted in accordance with AS/NZS 5667.11 and all water samples are collected and preserved in accordance with AS/NZS 5667.1.

#### 14.5.2 Exceedance Criteria

Trigger levels or exceedance criteria for groundwater are necessary to highlight increases in certain parameters of concern and to allow for investigation of potential causes of the adverse, unexpected or trend in monitoring data. Groundwater trigger criteria are attached in Appendix C.

#### 14.6 Waste Water Sampling

Sampling of treated waste water is required to ensure it meets discharge criteria as specified in the licence. The sampling locations, frequency and parameters, exceedance criteria, contingency and reporting for waste water management are outlined below.

##### 14.6.1 Sampling Locations

Treated waste water is to be sampled from the designated oil water separator sampling tap.

##### 14.6.2 Sampling Frequency and Parameters

Treated waste water from the oil water separator system should be sampled quarterly or at the frequency stated in the licence.

##### 14.6.3 Sampling process

Sampling of treated waste water from the oil water separator shall be undertaken in accordance with the following general sampling process outlined in Section 14.1.3 and in accordance with AS/NZS 5667.10.

##### 14.6.4 Exceedance Criteria

Samples should not exceed Licence requirements.

#### 14.7 Feral Animals and Vermin Monitoring

Ongoing monitoring of feral animals and vermin is required to ensure current management measures are effective and to identify any new species of populations of feral animals and pests.
Eight remotely monitored 3G/4G camera traps monitored by a licenced Pest Management Technician (PMT). A record of all feral pest species recorded on the 3G/4G camera traps will be recorded in the feral and pest species register. Batteries in the camera traps will be recharged/replaced at appropriate intervals by Site Staff.

All site staff is to monitor the active areas such as the tipping face, drains and culverts for evidence or presence of vermin.

Bait boxes/traps should be inspected regularly to ensure they are in their designated locations, for any damage and presence of deceased vermin. Any deceased vermin such as rodents will be removed immediately to discourage attraction of scavengers. A summary of feral animal and vermin monitoring requirements is shown in Table 14-9.

**Table 14-9: Feral Animal and Vermin Monitoring Requirements**

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Frequency</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera traps</td>
<td>As specified by contractor</td>
<td>PMT</td>
</tr>
<tr>
<td>Bait stations</td>
<td>As specified by contractor</td>
<td>PMT</td>
</tr>
<tr>
<td>Tipping face, drains, culverts etc.</td>
<td>Continuously</td>
<td>All Site Staff</td>
</tr>
<tr>
<td>Surface water ponds</td>
<td>Continuously</td>
<td>All Site Staff</td>
</tr>
</tbody>
</table>

**14.8 Weed Monitoring**

Due to the movement of vehicles in and out of the site and acceptance of green waste there is a potential for weed species to brought into site. Therefore monitoring of weeds is necessary to determine the presence of any new weed species that may been introduced to the site and to ensure current management measures are control and effective.

Where there are instances of known weed species within the site, these species will be monitored periodically to ensure that the population is not spreading. An annual monitoring program will be undertaken to assess the state of any existing weed locations and record any newly discovered outbreaks. Known weed locations shall be recorded in the site.

Areas where weeds have been removed or chemical treatment has been applied will be monitored within four weeks of treatment to ensure that the control strategy employed was sufficient and effective.
15 Inspections and Maintenance

All inspections and maintenance must be undertaken by suitably qualified personnel and according to the frequencies set out in this document or licence (insert licence number). The frequencies and requirements for inspections and maintenance may alter with modifications in infrastructure, systems and licence requirements and amendments and revised part of the annual review process.

15.1 Leachate Management System Inspections

Monitoring of leachate levels within the leachate collection evaporation ponds is required to ensure leachate levels do not exceed the site requirements. Monitoring of leachate within the primary and secondary sumps is undertaken on a monthly basis if not more frequently through an automated process. The volumes of leachate extraction will be monitored from flow meters or pumping records. A summary of leachate monitoring requirements are shown in Table 15-1.

Table 15-1: Leachate Management System Inspections

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Frequency</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leachate evaporation pond levels</td>
<td>Weekly or daily during heavy rainfall events</td>
<td>Site Operator</td>
</tr>
<tr>
<td>Leachate collection sump</td>
<td>Monthly (if not more frequently through an automated process)</td>
<td>Site Operator</td>
</tr>
<tr>
<td>Leachate flow meter/pumping records</td>
<td></td>
<td>Site Operator</td>
</tr>
</tbody>
</table>

15.2 Landfill Gas Management System Inspections

The inspection requirements for the Landfill Gas Management System are shown in Table 15-2. Gas collection system monitoring will depend on the gas generation rates and actual gas collection system infrastructure installed. Inspection frequencies may vary depending on site conditions.

Table 15-2: Landfill Gas Collection System Inspections

<table>
<thead>
<tr>
<th>Task</th>
<th>Frequency</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas Collection System</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspect wellheads and pipework for damage</td>
<td>2 monthly</td>
<td>Technician / Site Manager</td>
</tr>
<tr>
<td>Check wellhead connections and pipework for settlement</td>
<td>2 Monthly</td>
<td>Technician / Site Manager</td>
</tr>
<tr>
<td>Check pipes for condensate</td>
<td>2 Monthly</td>
<td>Technician / Site Manager</td>
</tr>
<tr>
<td>Inspect integrity of couplings and connections</td>
<td>6 Monthly</td>
<td>Technician / Site Manager</td>
</tr>
</tbody>
</table>
15.3 Surface Water Management System Inspections

Regular monitoring of the surface water management system is required to ensure the system is working effectively and to identify any maintenance and repairs of drains and other associated infrastructure that is required. The system shall be inspected for evidence of contamination, excessive sedimentation and structural integrity. Monitoring of the surface depressions along the sand ridge northeast of the landfill development footprint is also required to ensure any significant volumes of pooled water are removed via a mobile pump. A summary of the surface water monitoring requirements are show in Table 15-3.

Table 15-3: Surface Water Management System Inspections

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Frequency</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrity of surface water attenuation pond level</td>
<td>Weekly</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Integrity surface water infiltration ponds</td>
<td>Weekly</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Integrity surface water drains, bunding and channels</td>
<td>Weekly or daily during heavy rainfall events</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Integrity of levee embankment and rock armouring</td>
<td>Monthly</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Sand ridge surface depressions water levels</td>
<td>Following heavy rainfall events</td>
<td>Site Supervisor</td>
</tr>
</tbody>
</table>

15.4 Waste Water Management Systems Inspections

Monitoring of waste water containment systems are necessary to ensure no leaks or overflows occur which may cause contamination to the surrounding environment. These systems include the ablution storage tank, wash down bay sump and treated water storage tank. Ablution storage tank/s and treated water storage tank/s should levels should be checked on a regular basis. Regular visual inspection of the sump at the wash-down bay should be undertaken to ensure it does not overflow, particularly during heavy rainfall events. A summary of the monitoring requirements are shown in Table 15-4.

Table 15-4: Waste Water Management System Inspections

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Frequency</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ablution storage tank level</td>
<td>Weekly</td>
<td>Site Operator</td>
</tr>
<tr>
<td>Wash down bay sump level</td>
<td>Daily</td>
<td>Site Operator</td>
</tr>
<tr>
<td>Treated water storage tank level</td>
<td>Weekly</td>
<td>Site Operator</td>
</tr>
</tbody>
</table>

15.5 Fire Management System Inspections

Regular inspection of the fire risk management system is required to ensure the system is ready in the event of a fire onsite or near the site. The fire management system inspection requirements are shown in Table 15-5.
15.6 General site maintenance

Regular site maintenance is required to ensure the facility is kept tidy and safe. The maintenance tasks and their frequency are shown in Table 15-6.

Table 15-6: General Site Maintenance Schedule

<table>
<thead>
<tr>
<th>Maintenance Task</th>
<th>Frequency</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant machinery and equipment</td>
<td>As required</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Collection of litter</td>
<td>As required</td>
<td>Site Operator</td>
</tr>
<tr>
<td>Inspection of the perimeter fencing</td>
<td>Monthly</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Inspection of condition and location of signage</td>
<td>Monthly</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Ensuring fire breaks are kept clear of vegetation</td>
<td>6 Monthly</td>
<td>Site Operator</td>
</tr>
<tr>
<td>Road repairs and grading of unsealed tracks</td>
<td>As required</td>
<td>Site Operator</td>
</tr>
<tr>
<td>Inspection, maintenance and repairs of drains and other associated surface water management infrastructure</td>
<td>As required and during and after heavy rainfall events</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Check condition of bunding and refuelling bay</td>
<td>Monthly</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Check maintenance and storage shed for general cleanliness, appropriate storage of hydrocarbons and hydrocarbon contaminated materials</td>
<td>Quarterly</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>Pre cyclone season clean up:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Ensure the site is kept tidy</td>
<td>Prior to cyclone season (November to April)</td>
<td>Site Supervisor</td>
</tr>
<tr>
<td>- Tie downs are secure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Surface water management system is working efficiently and any repairs are made</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Freeboards are maintained</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
16 Incident and Emergency Procedures

In the event an incident or emergency occurs, the following procedures are to be undertaken.

16.1 Incidents

All incidents are to be reported to the Site Supervisor as soon as possible of the event occurring. Incidents are to be reported by completing an incident/hazard report form. The details required include, but are not limited to the following:

- Date
- Time of incident
- Location of incident
- Personnel involved
- Description of incident
- Actions undertaken

The incident reporting procedure is shown in the diagram below.

Diagram 7: Incident reporting Procedure

If the incident requires reporting to a government agency the Site Supervisor is to notify the waste coordinator or Shire representative within 24 hours of the incident occurring.
16.1.1 Spills and Leaks

Spills and leaks can occur during the refuelling of vehicles, during maintenance, accidents or damage to infrastructure. The following actions are required in the even a spill occurs:

- Stop the leak if possible
- If the leak is from a vehicle, promptly move the vehicle to a bunded area if possible
- If the spill is small, use spill granules or a hydrocarbon spill kit
- If the spill is large, use appropriate material to prevent the spill from spreading by creating a bund
- Remove the contaminated material and dispose of appropriately
- Undertake environmental investigations of contamination (if required)
- Report the incident as per the details in Section 16.1.

16.1.2 Major Breach of Landfill Liner

A major breach of the landfill liner can occur due to instability of the lining system or substrata however, the facility has been designed and constructed in accordance with Best Practice Landfill Standards and undergone a Construction Quality Control process. In the unlikely event that a major breach of the landfill liner occurs, the following actions should be undertaken:

- Leachate is removed from the affected landfill cell; and
- An engineer is engaged to access the liner and requirement for remedial action

16.1.3 Groundwater Contamination

If contamination of groundwater occurs, the following actions will be undertaken:

- Investigation and identify the type of contamination;
- Identify the source of contamination
- Assess the potential risk
- Report contamination to DWER
- Isolate the source of contamination (if possible)
- Determine appropriate treatment/remediation required
- Undertake groundwater monitoring following treatment/remediation
- Review management measures
- Amend management measures and procedures (if required).

16.1.4 Instability of Waste Mass

In the event the waste mass is determine to be unstable through topographic surveys or visual evidence, a suitably qualified engineer will review the landfill and determine if remedial action is required. Depending on the significance of the instability, one or more of the following actions will be undertaken:

- Continue monitoring the waste mass through both visual and topographical surveys
- No placement of waste is to occur at on top of, at the base or on to the waste mass
- Landfill filling to be adjusted to rectify the issue
- Reduce the gradient of slope through engineering works
- Redesign future landfill cell phases to reduce instability risks.

16.2 Emergency Procedures

In the event of an emergency, the following steps shall be undertaken:

- Call ‘000’:
  - State who you are
  - Where the emergency is located
  - The nature of the emergency
  - Type of assistance required.
- Follow instructions of emergency services
- Contact the Site Supervisor and report incident.

16.2.1 Fire

If a fire occurs within a building the following actions shall be undertaken:

- Raise the alarm
- Evacuate the building and area
- If the fire can be suppressed safely, firefighting equipment on site should be used
- If the fire cannot be extinguished safely, contact emergency services
- If safe to do so, isolate the buildings electricity
- All personnel are to go to the muster point
- Check all personnel are accounted for
- Only emergency vehicles are to enter the site
- The fire is reported to the Site Supervisor
- All personnel to follow instructions from the emergency services.

If a fire occurs in the operational area the following actions shall be undertaken:

- Raise the alarm
- Cease works immediately and evacuate vehicles
- If the fire can be suppressed safely, the operator shall use the bucket or blade to smother the fire from the outside working towards the centre
- If the fire continues to burn, the material shall be removed, then respread on top of inert material and smothered
- The water cart should be called to the tipping face to extinguish the fire
- If the fire cannot be extinguished safely, contact emergency services
- All personnel are to go to the muster point
- Check all personnel are accounted for
- Only emergency vehicles are to enter the site
- The fire is reported to the Site Supervisor
• All personnel to follow instructions from the emergency services.

If a fire occurs in vehicles or machinery the following actions shall be undertaken:

• Cease works immediately and evacuate the vehicle
• If the fire can be suppressed safely, the operator shall use a fire extinguisher to smother the fire
• If the fire cannot be extinguished safely, contact emergency services
• If there is a risk of fire within the tyre that may cause an explosion, a large safety exclusion zone (300m) must be maintained
• All personnel are to go to the muster point
• Check all personnel are accounted for
• Only emergency vehicles are to enter the site
• The fire is reported to the Site Supervisor
• All personnel to follow instructions from the emergency services.

16.2.2 Explosions

The key risk for explosions at the PRWMF is associated within landfill gas generation and the storage of dangerous goods generation. In the unlikely event of an explosion, the actions to be undertaken are the same in the event of a fire.

If explosive waste materials are discovered within the landfill or waste materials accepted at the site, the following actions shall be undertaken:

• Raise the alarm
• Evacuate the area
• Call emergency services ‘000’
• Contact the Site Supervisor
• All personnel to follow instructions from the emergency services.

16.2.3 Cyclones

In the event of a cyclone, the following procedures must be followed:

• Stay informed with the Bureau of Meteorology and DFES notifications/warnings and advice
  o [https://www.emergency.wa.gov.au/](https://www.emergency.wa.gov.au/)
• Assess cyclone rating and path to determine risk level and actions required:
  o Blue Alert – Cyclone preparation
  o Yellow Alert – Take action and get ready to shelter from a cyclone
  o Red Alert – Take shelter from the cyclone immediately
• Advise all personnel of approaching cyclone and risk
• Ensure the site is clear of loose items as far as practicable and tie downs are secure
- Check the integrity of the surface water management systems, repair if necessary and clear any obstructions
- Secure all buildings and turn off electricity and water
- If the cyclone is less than 48 hours from impacting the site all personnel to safely vacate the site and seek adequate shelter
- If time does not permit vacating the site, ensure all staff are safe within cyclone rated buildings with adequate supplies
- Maintain emergency contacts numbers
- Once the all clear has been issued and the cyclone has passed, continue to stay informed with the Bureau of Meteorology and DFES notifications and respond accordingly.
# 17 Complaints Register

A complaints register is maintained to record any internal or external complaints regarding the operation of the PRWMF. If a complaint is received, the actions outlined in Table 17-1 shall be undertaken.

## Table 17-1: Complaints Register Process

<table>
<thead>
<tr>
<th>Stage</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complaint Received</td>
<td>The following details should be recorded from the complainant:</td>
</tr>
<tr>
<td></td>
<td>• Name, address and contact number of complainant;</td>
</tr>
<tr>
<td></td>
<td>• Time complaint received;</td>
</tr>
<tr>
<td></td>
<td>• Description of issue (odour, noise etc.);</td>
</tr>
<tr>
<td></td>
<td>• Location of complaint;</td>
</tr>
<tr>
<td></td>
<td>• Date(s) and time(s) to which the complaint relates; and</td>
</tr>
<tr>
<td></td>
<td>• Duration of issue.</td>
</tr>
<tr>
<td>Investigation</td>
<td>The Site Supervisor will follow up the complaint within 24 hours of receipt.</td>
</tr>
<tr>
<td>Determination of abatement method</td>
<td>The Site Supervisor is to determine the potential cause of the complaint and the appropriate abatement method required (if relevant).</td>
</tr>
<tr>
<td>Implementation of abatement method</td>
<td>The Site Supervisor is to deploy an appropriate abatement method within 48 hours of receipt of the complaint.</td>
</tr>
<tr>
<td>Closing of complaint</td>
<td>The Site Supervisor will contact the complainant to communicate the actions undertaken to rectify the issue.</td>
</tr>
<tr>
<td>Notification of the Shire</td>
<td>The Site Supervisor is to notify the Shire (Manager) of the Complaint received, determination and abatement once abatement has been adopted. The Shire is to be notified of complainants of a high severity as soon as practically possible of it been received.</td>
</tr>
<tr>
<td>Reporting</td>
<td>The Complainants register is to be included within the AER.</td>
</tr>
</tbody>
</table>
18 Compliance Reporting

The facility is required under Part V of the *Environmental Protection Act 1986* (EP Act) to submit annual reports to relevant government agencies to provide data and information on environmental performance and compliance with licence conditions. The compliance reports include an Annual Environmental Report (AER), annual Audit Compliance Report (ACR) and annual Groundwater Monitoring Report.

*Note: The specific reporting requirements for the PRWMF will be refined to reflect the requirements of the DWER licence.*

18.1 Annual Environmental Report

An Annual Environmental Report (AER) must be submitted to the Chief Executive Officer (CEO) at the end of each annual period.

18.2 Annual Audit Compliance Report

Under Part V of the EP Act, prescribed premises are required to submit an Annual Audit Compliance Report (AACR) as part of licence requirements. The AACR is a self-auditing process that allows licence holders to assess their compliance with their licence requirements during the reporting period. The AACR must adhere to the DWER’s template and should be provided as an appendix to the AER.

18.3 Annual Groundwater Monitoring Report

An Annual Groundwater Monitoring Report shall be completed to outline the findings the groundwater sampling undertaken during the reporting period. Groundwater is to be sampled at the frequency and parameters listed in Table 14-8. The Groundwater Monitoring Report should be provided as an appendix to the AER.
19 Rehabilitation and Closure

It is important during closure and post closure, the facility is maintained in a safe and stable state. Therefore there are a number of tasks required in order to achieve this. Although more detailed rehabilitation and closure plan will be developed towards the end of the lifespan of the facility, the key closure requirements include the final waste profile, capping and rehabilitation, reporting requirements, environmental monitoring and maintenance.

19.1 Objectives

The objectives of rehabilitation and closure are to ensure:

- All landfill cells are capped to specifications
- Environmental monitoring continues according to licence requirements
- The facility is left in safe and stable state.

19.2 Final Waste Profile

An integral part of the restoration of the landfill is the final post-settlement fill profile. The landfill profile needs to comply with the gradients specified within the Best Practice Landfill Standards which are between 1:5 and 1:20. The key objectives of the final fill profiles as stipulated within the Best Practice Landfill Standards are to:

- Ensure the long term stability and integrity of the capping material and containment layer
- Promote natural surface water run-off
- Provide an aesthetically acceptable landform
- Minimise long-term maintenance requirements.

A survey will be undertaken following the final deposition of waste to ensure that final pre-settlement waste levels meets the specifications.

19.3 Capping and Rehabilitation

After each cell has reached pre-settlement contours, capping of the cell shall be initiated. Capping is required to minimise the infiltration of rainfall into the waste thereby minimising the generation of leachate. It is also required to provide a protective and stable barrier, prevent the escape of landfill gas and odours and improve amenity. Capping of all cells will be undertaken progressively and according to the following requirements:

- 300mm of permeable material which acts as a regulating layer, and being sandy soils obtained from the surplus superficial overburden, will encourage gas to be collected under the low permeability sealing liner
- GCL and/or linear low density polyethylene (LLDPE) geomembrane to provide a sealing liner.
- 1.2m thick layer of indigenous soils obtained from the overburden used to protect the low permeability capping layer and support revegetation
• The surface should be landscaped in accordance with the agreed land-use restoration scheme to avoid long-term erosion.

19.4 Post Closure Environmental Monitoring

Environmental monitoring will continue throughout closure of the facility and post closure as required under licence conditions. The key aspects requiring post closure monitoring include groundwater and landfill gas. The frequency of monitoring will be set following guidance from the relevant government agency.

19.5 Post Closure Maintenance

To ensure the facility is maintained following closure, a maintenance and care programme will be developed which will ensure inspection and maintenance of the following are conducted:

• Fencing and gates
• Monitoring wells and associated infrastructure
• Landfill topography (signs of differential settlement)
• Landfill gas infrastructure.
20 Implementation of the OEMP

All PRWMF staff, including contractors, will be given appropriate training and/or an induction in order to make them aware of how the site should be operated and managed. This will include ensuring compliance with this OEMP. Table 4-1 illustrates the organisation structure of the facility. Each of the roles and their respective responsibilities are discussed in the section below.

20.1 Roles and Responsibilities

Each of the roles and their respective responsibilities are discussed in the section below.

20.1.1 Site Supervisor

The Site Supervisor ensures that the:

- Site operations comply with relevant licences, legislation and regulations;
- OEMP is implemented at the site;
- OEMP and relevant supporting documentation is reviewed regularly and is updated, as required;
- Contractors and visitors to the site comply with the OEMP; and
- Site staff and other relevant personnel are aware of their responsibilities and comply with the OEMP.

20.1.2 Site Operator

The Site Operator ensures that they:

- Comply with relevant licences, legislation and regulations;
- Are aware of, and conduct their work in compliance with, the OEMP;
- Report any non-conformances to the Site Supervisor as soon as practicable; and
- Undertake training and induction as directed by the Site Supervisor.

20.1.3 Contractors

Contractors visiting the site to undertake work ensure that they:

- Comply with relevant licences, legislation and regulations;
- Are aware of, and conduct their work in compliance with, the OEMP;
- Report any non-conformances to the Site Supervisor as soon as practicable; and
- Undertake training and induction as directed by site personnel.
Appendix A: DWER Licence
Appendix B: Asbestos Management Plan
Asbestos Management Plan

Pilbara Regional Waste Management Facility

Prepared for Shire of Ashburton
August 2018
Project Number: TW18004
### DOCUMENT CONTROL

<table>
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<th>Description</th>
<th>Date</th>
<th>Author</th>
<th>Reviewer</th>
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<td>25/7/18</td>
<td>EP</td>
<td>LM</td>
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<td>1a</td>
<td>Final Report</td>
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<tr>
<td>Ronan Cullen</td>
<td>Director and Waste Management Section Leader</td>
<td>TW18004 - Asbestos Management Plan.1a</td>
</tr>
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# Table of Contents

1 **Introduction** .................................................................................................................................................. 1  
1.1 Objectives ......................................................................................................................................................... 1  
1.2 Legislation and Guidelines ................................................................................................................................. 1  
1.3 Definitions ............................................................................................................................................................ 2  
1.4 Health impacts ...................................................................................................................................................... 2  
1.5 Classification of asbestos ...................................................................................................................................... 2  
1.6 Responsibilities .................................................................................................................................................. 3  
1.7 Training .............................................................................................................................................................. 4  
2 **Personal Protective Equipment** ......................................................................................................................... 5  
2.1 Safety goggles ...................................................................................................................................................... 5  
2.2 Respirators ......................................................................................................................................................... 5  
2.3 Disposable coveralls ........................................................................................................................................... 5  
2.4 Gloves ................................................................................................................................................................. 6  
2.5 Footwear ............................................................................................................................................................ 6  
2.6 Removal of PPE and Personal Decontamination ............................................................................................... 6  
3 **Pre Acceptance** ................................................................................................................................................. 7  
4 **Acceptance** ....................................................................................................................................................... 8  
4.1 Declared Asbestos loads ....................................................................................................................................... 8  
4.2 Non-Declared Asbestos Loads ............................................................................................................................ 8  
5 **Transport and Handling** .................................................................................................................................. 10  
6 **Disposal** .......................................................................................................................................................... 11  
7 **Incidents** .......................................................................................................................................................... 12  
7.1 Asbestos Spills .................................................................................................................................................... 12  
7.2 Exposure to Asbestos .......................................................................................................................................... 12  
8 **Records** ........................................................................................................................................................... 14
Tables

Table 4-1: Asbestos Risk Level Assignment for C&D Waste

Diagrams

Diagram 1: Asbestos Management Process

Appendices

Appendix A: Examples of asbestos containing materials
1 Introduction

This Asbestos Management Plan (AMP) has been prepared to outline the requirements and procedures for asbestos management at the Pilbara Regional Waste Management Facility (PRWMF). The PRWMF will be licensed as a Prescribed Premises Category 65, which will be able to accept Type 1 Special Waste (asbestos). The AMP is required to outline the correct acceptance, handling and disposal procedures to ensure asbestos is managed safely and in accordance with licence requirements at the PRWMF.

Asbestos may also be present within non-declared waste loads brought to the PRWMF, which can present a risk to personnel, plant and recycled products. Of particular importance is the identification of asbestos, which can present risks to human health. Asbestos is a known carcinogen and requires the implementation of strict and specific management measures to protect the health of all staff and visitors. Therefore, this AMP also details the correct personal protective equipment (PPE), operating procedures, incident management and record keeping requirements.

1.1 Objectives

The objectives of the AMP are to:

- Provide guidance on how to manage asbestos and asbestos contaminated material (ACM) delivered to site or if discovered on site;
- Ensure appropriate procedures are carried out for the inspection, handling and disposal of asbestos material;
- Ensure the appropriate management of asbestos related incidents are undertaken; and
- Ensure the appropriate record keeping for asbestos acceptance, rejection, disposal and incidents.

1.2 Legislation and Guidelines

There are a range of regulations and guidelines related to management of asbestos, which were considered during the development of this AMP:

- Environmental Protection (Controlled Waste) Regulations 2004;
- Guidelines for Managing Asbestos at Construction and Demolition Waste Recycling Facilities (DEC, 2012);
- Disposal of Material Containing Asbestos (DEC, 2007);
- Health (Asbestos) Regulations 1992;
- Code of Practice for the Management and Control of Asbestos in the Workplace [NOHSC: 2018 (2005)]; and
- Department of Health - Guidelines for Asbestos-Contaminated Sites (DOH, 2009).
1.3 Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos</td>
<td>The asbestiform variety of mineral silicates belonging to the serpentine or amphibole groups of rock-forming minerals and includes actinolite, amosite, anthophyllite, chrysolite, crocidolite, tremolite and any mixture containing 2 or more of those.</td>
</tr>
<tr>
<td>Asbestos Containing Material (ACM)</td>
<td>Products or materials (including fragments) that contain asbestos in an inert bound matrix such as cement or resin in a sound condition and in a Form that cannot pass through a 7mm x 7mm sieve.</td>
</tr>
<tr>
<td>Asbestos fines or fibres</td>
<td>Includes small asbestos fibre bundles, free asbestos fibres and also ACM fragments that can pass through a 7mm x 7mm sieve.</td>
</tr>
<tr>
<td>Competent person</td>
<td>A person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill, for the safe performance of the specific work.</td>
</tr>
<tr>
<td>Fibrous asbestos</td>
<td>Includes friable asbestos material, such as severely weathered ACM And asbestos in the form of loose fibrous material such as insulation products. Friable asbestos is material that is in a degraded condition such that it can be broken or crumbled to a powder form by hand pressure.</td>
</tr>
<tr>
<td>Personal Protection Equipment</td>
<td>Equipment and clothing that is used or worn by an individual person to protect themselves against, or minimise their exposure to, workplace risks. It includes items such as facemasks and respirators, coveralls, goggles, helmets, gloves and footwear.</td>
</tr>
</tbody>
</table>


1.4 Health impacts

Asbestos is a known carcinogen that can cause mesothelioma, lung cancer and asbestosis. Asbestos fibres inhaled deep into the lungs can result in damage to mesothelial cells in the body and lead to the development of a type of cancer called mesothelioma. Lung cancer, which differs from mesothelioma and specifically affects the lungs, can also result from asbestos exposure. Asbestosis, a non-cancerous condition, is caused by the scarring of the lung tissue from asbestos fibres, which results in a reduced ability of the lungs to transfer oxygen to the blood. The latency periods generally range between 35-40 years for mesothelioma, 20-30 years for lung cancer and 15-20 years for asbestosis.

1.5 Classification of asbestos

Asbestos is classified as friable asbestos or non-friable asbestos. Friable asbestos is asbestos that can be easily crumbled, pulverised or reduced to powder. Examples of friable asbestos are tiles, clutch plates and pipe insulation. Non-friable asbestos is a common form of asbestos that is held together
with a strong binder. Asbestos fibres in non-friable asbestos may be released through damage, mishandling or weathering. Asbestos can also be present in a range of materials called Asbestos Containing Material (ACM). Examples of ACM are provided in Appendix A.

1.6 Responsibilities

The responsibilities of site users and the site personnel regarding asbestos management is listed below:

Site Users

- Give 24 hours’ notice of an asbestos load to the gatehouse;
- Declare all asbestos or asbestos contaminated loads; and
- Wrap all asbestos in accordance to pre-acceptance requirements (Section 3).

Site Supervisor

- Implement, maintain and update the Asbestos Management Plan;
- Ensure all staff are trained in the identification, handling, correct disposal of asbestos (Section 1.7) and are aware of the Asbestos Management Plan;
- Ensure asbestos acceptance, correct handling and disposal procedures are implemented;
- Maintain adequate supplies of appropriate PPE; and
- Maintain adequate supply of asbestos wrapping materials.

Weighbridge Attendant

- Adhere to the Asbestos Management Plan;
- Question all site users on the potential presence of asbestos in loads;
- Inspect all loads entering the site;
- Wear appropriate PPE when undertaking inspections or handling of asbestos or suspected asbestos containing loads;
- Register all accepted and rejected asbestos loads; and
- Notify the Site Operator of any accepted load ready for disposal.

Site Operator

- Adhere to the Asbestos Management Plan;
- Wear appropriate PPE when undertaking inspections or handling asbestos or suspected asbestos containing loads;
- Assess all non-declared asbestos loads and potential risks;
- Ensure the appropriate handling and disposal of asbestos; and
- Maintain an asbestos register.
1.7 Training

All personnel must be trained in the appropriate inspection, handling and disposal of asbestos materials. Training must be undertaken by a suitable qualified internal or external training provider. The training shall include but not be limited to:

- Health risks associated with asbestos;
- Common sources of asbestos wastes;
- Identification of asbestos waste;
- Roles and responsibilities;
- PPE and its correct use;
- Asbestos acceptance procedures; and
- Asbestos disposal procedures.
2 Personal Protective Equipment

All personnel must ensure appropriate PPE is worn when handling asbestos. A description of each type of PPE required is detailed below. PPE must be put on in the following order:

1. Safety goggles;
2. Respirator or Mask;
3. Disposable coveralls;
4. Disposable gloves; and
5. Disposable overshoes or washable boots.

2.1 Safety goggles

If a full face respirator is not required, personnel must wear suitable safety goggles. Safety goggles must be decontaminated following use.

2.2 Respirators

Depending on the nature of asbestos handling, concentration of asbestos fibres and facial characteristics (i.e. facial hair, glasses etc.) an appropriate respirator should be worn. The following should be considered for respirator use:

- The requirement for a P2 or P3 respirator should be determined by a competent person;
- Comply with Australian/New Zealand Standard (AS/NZS) 1716-2003 Respiratory Protective Devices;
- Be maintained in accordance with ‘AS/NZS 1715-1994 Selection, Use and Maintenance of Respiratory Protective Devices’;
- Worn under fitted hoods;
- Face pieces should be cleaned and disinfected according to the manufacturer’s instructions and issued to individuals for exclusive use;
- Defects should be reported immediately for replacement or repair;
- All used filters should be disposed of as asbestos waste; and
- People with prescription glasses must either wear modified spectacles or wear supply hoods instead.

2.3 Disposable coveralls

Disposable coveralls should be worn to prevent adequate protection against asbestos fibre penetration. Coveralls should be type 5, category 3 (prEN ISO 13982–1 Protective clothing for use against solid particulates) or equivalent. Type 5 protective clothing typically has the following specifications:

- Inward leakage (IL) ≤30% IL for 91.1% (or more) of all values measured (all exercises, all sampling positions all suits); and
- Total inward leakage (TILS) ≤15% for 80% (or more) of all TILS values.
Coveralls should be one size too big to avoid potential ripping at seams, fitted with a hood and cuffs. The hood should be worn over respirator straps and coverall legs are worn over footwear (i.e. not tucked in). The coveralls once used should be disposed as asbestos waste. The use and washing of reusable protective clothing is not recommended. If reusable protective clothing is used it must be kept in a sealed container and laundered at a suitable laundering facility.

2.4 Gloves

The requirement for gloves will be determined by a risk assessment. Single use disposable gloves should be disposed of as asbestos waste following use. If latex gloves are to be used it is recommended to wear low protein (powder free) gloves. Following removal and disposal of gloves, all personnel must wash their hands and fingernails thoroughly.

2.5 Footwear

Appropriate footwear should be worn when handling asbestos. The appropriate safety footwear includes laceless washable boots or disposable shoe covers or overshoes. However, the use of disposable overshoes can present a slipping risk therefore should be avoided. Reusable safety footwear should not be used for any other purposes. All reusable footwear should be decontaminated or sealed in double bags.

2.6 Removal of PPE and Personal Decontamination

Prior to removal of used PPE, visible asbestos shall be removed from protective clothing using an asbestos vacuum or wet wiping. PPE should be removed in the following order:

1. Disposable overshoes or washable boots;
2. Disposable coveralls;
3. Disposable gloves;
4. Safety goggles; and
5. Respirator or mask.

Coveralls should be removed by taking arms out of the sleeves and rolling the sleeves inside out and then rolling the coveralls down the body. Non-disposable respirators should be thoroughly cleaned and any contaminated filters removed for appropriate disposal.

Used disposable PPE is to be placed in a sealed heavy-duty 200μm (micrometres) (minimum thickness) polythene bag no more than 1,200mm long and 900mm wide. The outside of the bag should be wiped down using a damp cloth. The bag should then be sealed with duct tape and labelled as “Asbestos Waste”.

Following removal of PPE, personnel are to thoroughly clean their face, hands and fingernails with soapy water.
3 Pre Acceptance

Prior to delivery of asbestos loads, 24 hours’ notice must be given to the PRWMF’s gatehouse. All asbestos loads will be inspected by the weighbridge attendant on arrival to ensure materials are packaged in accordance with the following requirements:

- **Friable asbestos and fragmented non-friable asbestos:**
  - Must be wrapped in a minimum 200μm thickness new polythene bags which are:
    - not damaged;
    - not more than half full to minimise the risk of tearing and to assist in manual handling;
    - have all air expelled (carefully, to avoid the release of dust);
    - twisted slightly, folded over and secured with adhesive tape;
    - double bagged (friable asbestos);
  - Secured in a lined and sealed drum/container or truck clearly labelled with a dangerous goods and asbestos warning label; and
  - Asbestos contaminated soils:
    - Must be transported in a sealed container or truck and kept wet at all times.

- **Non-friable or bonded asbestos (asbestos sheeting):**
  - Must be double wrapped in a minimum of 200μm thickness new and undamaged polythene bags;
  - Labelled appropriately with asbestos warning label; and
  - Placed in a completely sealed double lined skip bin.
4 Acceptance

The PRWMF is a Class IV facility that is licenced to accept asbestos material for disposal. It is a persons’ responsibility under the Health (Asbestos Regulations) 1992, to declare the presence of asbestos material for disposal. The following acceptance procedures are relevant to the acceptance of declared asbestos loads and non-declared asbestos loads (i.e. contaminated C&D waste loads).

4.1 Declared Asbestos loads

All asbestos loads will be inspected by the weighbridge attendant to ensure materials are packaged in accordance with pre acceptance wrapping requirements (Section 3). If the waste load is accepted, it is entered in the asbestos register. The weighbridge attendant must then inform the Site Operator of the asbestos load. Following confirmation/approval from the Site Operator, the weighbridge attendant is to direct the customer/driver to the Asbestos Monocell.

If the Asbestos Waste is not appropriately wrapped or bagged, the Asbestos load will be rejected. Rejected asbestos loads are to be recorded in the rejected loads register. The requirements for the appropriate wrapping of asbestos will be communicated to the customer. The customer will be asked to comply with these requirements before returning the load to the PRWMF for acceptance.

4.2 Non-Declared Asbestos Loads

General waste and C&D loads have the potential to contain asbestos or ACMs. All general waste and C&D waste loads will be inspected by the weighbridge attendant to identify the presence of asbestos. If asbestos is identified, the weighbridge attendant will issue a fine to the customer and reject the load.

Upon acceptance of C&D waste loads, the risk of each load containing asbestos will be assessed based on the information in the customer declaration. The low and high risk rating for each type of C&D waste category is shown in the table below:

<table>
<thead>
<tr>
<th>Material</th>
<th>Commercial</th>
<th>Skip Bin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean concrete</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Clean brick</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Clean bitumen</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Mixed construction waste</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Mixed demolition waste</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Once a risk classification has been allocated, loads will be taken to the appropriate unloading area, with separate designated areas for low and high risk loads. High risk loads shall be visually inspected during offloading. Low risk loads are to be inspected as soon as practicable and prior to stockpiling and processing. High risks loads must be spread to approximately 30cm thickness for further detailed inspection. The load is to be inspected by trained personnel wearing appropriate PPE.
If asbestos is identified, the Site Operator shall report the asbestos load to the Site Supervisor immediately and identify the customer. If the customer ID is known the Site Operator or Site Supervisor shall notify the customer of the breach. The customer will then be fined for failing to declare the asbestos or ACM. The customer will then be required to remove the asbestos from site, wrap or contain appropriately and return the load giving 24 hours notification. If the customer is not identified, the asbestos load shall be wrapped or contained by trained personnel and disposed of in the Asbestos Monocell.

If suspect asbestos is identified during the waste inspection but is not able to be easily removed, the load will be assumed to be contaminated, isolated and wet down. The contaminated load is to be bagged and sealed in accordance with wrapping requirements (Section 3). If the suspect material is able to be removed it will either be assumed to be asbestos, put into an appropriate container or wrapped. Contaminated loads must be kept isolated and barricaded/demarcated and wet down with a fine mist and managed by trained personnel only. All contaminated loads will be transported to the Asbestos Monocell as per transport and handling requirements (Section 5) and disposed as per the asbestos disposal procedure (Section 6).

Trained staff will continue to inspect C&D waste materials for asbestos or ACM during processing and, if suspect material is identified, operations will cease and material will be isolated and wet down and disposed of in the Asbestos Monocell as detailed in Section 6.
5 Transport and Handling

In order to minimise the risk of spills and exposure to asbestos, the following management measures must be implemented during the transport and handling of asbestos:

- All asbestos loads must be covered during transport;
- All asbestos loads should be wet down prior to disposal;
- All vehicles and machinery must ensure internal air circulation is used and windows are closed on arrival at the tip face and exiting the facility;
- The driver must follow the directions of the Site Operator;
- All personnel to wear appropriate PPE (Section 2) when handling asbestos waste or if located outside of vehicles or machinery during unloading;
- Loads must be handled, unloaded and placed in the cell carefully to avoid damaging packaging and generation of dust.
6 Disposal

The correct disposal of asbestos will ensure the safety of staff and users. The requirements for the disposal of asbestos waste are as follows:

- An exclusion zone must be established during the unloading of asbestos;
- All untrained personnel must remain outside the exclusion zone;
- All asbestos loads should be wet down (with a fine mist) prior to unloading;
- Asbestos must be unloaded using either front end loader or excavator;
- Loads should be dropped off as close to the active monocell as possible to minimise handling of the material and potential for damage to packaging to occur;
- The Geographical Positioning System (GPS) coordinate of each asbestos load greater than 1m³ will be recorded to map the location, type and quantity of all asbestos disposed in the cell on the premises plan;
- The Site Operator and/or Site Supervisor must witness the disposal and immediate covering of the asbestos load with suitable material such as inert material or clean fill at a minimum of 1000mm thickness;
- No compaction of asbestos is to occur however, compaction of the cover material is accepted;
- After burial the asbestos should not be disturbed; and
- The final cover should be a minimum of 1m for non-friable asbestos and 3m for friable asbestos.
7 Incidents

Asbestos related incidents may include the spillage or escape of asbestos fibres or exposure to asbestos through the lack of or inappropriate PPE. The following management measures are to be undertaken in the event either of these incidents occurs.

7.1 Asbestos Spills

In the event friable asbestos escapes during handling or unloading the following procedure must be undertaken:

- Clear the area or site personnel and vehicles;
- Notify the Site Supervisor immediately;
- Trained personnel wearing appropriate PPE are to manage the spill/escape;
- All asbestos and dust to be wet down with a fine mist;
- Cover the asbestos with 200mm with clean soil or low level contaminated soil;
- Transport the covered asbestos to the monocell according to transport and handling requirements (Section 5);
- Do not directly compact asbestos, compacting is allowed on the cover only;
- Ensure earthmoving equipment does not come into direct contact with asbestos;
- Site Supervisor to complete an incident report which includes, but is not limited to, the following information:
  - Date;
  - Personnel involved;
  - Type of asbestos;
  - Quantity of asbestos;
  - Description of incident;
  - Actions/management measures undertaken; and
  - Future preventative measures.

7.2 Exposure to Asbestos

If a person is exposed to asbestos without the use of appropriate PPE the following decontamination procedure must be undertaken:

- Immediately wet down the person with fine spray/mist of water;
- The person must then walk to the nearest shower facility (if not, vehicles or machinery may be contaminated);
- Gently remove all contaminated clothing and place in a sealed bag;
- Shower to remove all dust and asbestos fibres with particular focus on the hair, face, hands and fingernails;
- Change into clean clothing; and
- The bag must be labelled with “Asbestos Waste” and disposed of appropriately.
All personnel assisting with the decontamination procedure must wear, as a minimum, a P2 dust mask. The incident must then be reported to the Site Supervisor. The Site Supervisor must enter the incident into the Asbestos Register.
8 Records

All acceptance, rejection and disposal of asbestos must be recorded in an asbestos register. Following inspection of all declared and non-declared waste loads, the weighbridge attendant will either accept or reject loads. Both accepted and rejected asbestos loads are to be entered into the asbestos register.

The details required for both accepted and rejected asbestos loads includes:

- Date;
- Name of user/customer;
- Contact details of user/customer;
- Name of staff member;
- Vehicle registration of user/customer;
- Source of asbestos;
- Estimated quantity of asbestos;
- Accepted or rejected; and
- Reason for rejection (if relevant).

Following appropriate disposal of asbestos loads, the Site Operator/Site Supervisor must sign the asbestos register within 2 hours of burial of the waste to confirm asbestos has been disposed of appropriately according to these procedures.

Any asbestos related incidents must also be recorded in the asbestos register. Records of any asbestos incidents must be kept for a minimum of 40 years.
Asbestos Management Process

The following diagram summarises the correct asbestos management process.

Diagram 1: Asbestos Management Process
References


Department of Health (2009) Guidelines for Asbestos-Contaminated Sites

*Environmental Protection (Controlled Waste) Regulations 2004*

*Health (Asbestos) Regulations 1992*


Worksafe Victoria (2010) Coveralls used for asbestos removal

Appendix A: Examples of asbestos containing materials
A

Air-conditioning ducts: exterior or interior acoustic and thermal insulation
Asbestos cement sheet underlays for vinyl
Asbestos cement storm drain pipes
Arc shields in lift motor rooms or large electrical cabinets
Asbestos cement water pipes (usually underground)
Asbestos-based plastics products - as electrical insulates and acid-resistant compositions or aircraft seat
Asbestos-containing laminates (e.g. formica) used where heat resistance is required, e.g. ships
Asbestos ceiling tiles
Asbestos-containing pegboard
Asbestos cement conduit
Asbestos felts
Asbestos cement electrical fuse boards
Asbestos marine board, e.g. marinate
Asbestos cement external roofs and walls
Asbestos mattresses used for covering hot equipment in power stations
Asbestos Cement in the use of form work when pouring concrete
Asbestos paper used variously for insulation, filtering and production of fire resistant laminates
Asbestos cement sheet internal over exhaust canopies such as ovens, fume cupboards, etc.
Asbestos cement internal flues and downpipes
Asbestos cement moulded products such as gutters, ridge cappings, gas meter covers, cable troughs and covers
Asbestos roof tiles
Asbestos textiles
Asbestos cement pieces for packing spaces between floor joists and piers
Asbestos textile gussets in air-conditioning ducting systems
Asbestos cement (underground) pits, as used for traffic control wiring, telecommunications cabling, etc
Asbestos yarn
Autoclave / steriliser insulation
Asbestos cement render, plaster, mortar and coursework
Asbestos cement sheet
Asbestos cement sheet behind ceramic tiles
Asbestos cement sheet
Asbestos cement sheet behind ceramic tiles

B

Bitumen-based water proofing such as malthoid, typically on roofs and floors but also in brickwork
Bituminous adhesives and sealants
Boiler gaskets
Boiler insulation, slabs and wet mix
Brake disc pads
Brake linings

Cable penetration insulation bags (typically Telecom)
Calorifier insulation
Car body filters (not common)
Caulking compounds, sealant and adhesives
Cement render
Chrysotile wicks in kerosene heaters
Clutch faces
Compressed asbestos cement panels for flooring, typically verandas, bathrooms and steps for demountable buildings
Compressed asbestos fibres (CAF) used in brakes and gaskets for plant and automobiles

D
Door seals on ovens
Gauze mats in laboratories / chemical refineries

E
Electric heat banks - block insulation
Electric hot water services - normally not asbestos but some millboard could be present
Exhausts on vehicles

F
Fire blankets
Fire curtains

Fire door insulation
Fire-retardant material on steel work supporting reactors on columns in refineries in the chemical industry
Fire-rated wall rendering containing asbestos with mortar
Fire-resistant plaster board, typically on ships
Filler in acetylene gas cylinders
Flexible hoses
Floor vinyl sheets
Floor vinyl tiles
Fuse blanks and ceramic fuses in switchboards

G
Gaskets - general
Galbestos™ roofing materials (decorative coating on metal roof for sound proofing)
Gaskets - chemicals, refineries
Gloves - asbestos

H
Hairdryers - insulation around heating elements
Electric light fittings, high wattage, insulation around fitting (and bituminised)
Header (manifold) insulation
Electrical switchboards – see Pitch-based

I
Insulation in electric reheat units for air-conditioner systems
Insulation blocks
## Asbestos Management Plan

**Pilbara Regional Waste Management Facility**  
**Shire of Ashburton**

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**L**
- Laboratory bench tops
- Laboratory fume cupboard panels
- Lagging in penetrations in fireproof walls
- Laboratory ovens - wall insulation
- Lagged exhaust pipes on emergency power generators
- Limpet asbestos spray insulation
- Locomotives - steam; lagging on boilers, steam lines, steam dome and gaskets

**M**
- Mastics
- Sprayed insulation - fire retardant sprayed on nut internally, for bolts holding external building wall panels
- Millboard between heating unit and wall
- Millboard lining of switchboxes
- Mortar

**P**
- Packing materials for gauges, valves, etc., can be square packing, rope or loose fibre
- Paint, typically industrial epoxy paints
- Packing material on window anchorage points in high rise buildings
- Penetrations through concrete slabs in high rise buildings
- Pipe insulation including moulded Sections, water-mix type, rope braid and sheet
- Pitch-based (e.g. zelemite, ausbestos, lebah) electrical switchboard
- Plaster and plaster cornice adhesives

**R**
- Refractory linings
- Refractory tiles
- Rubber articles - extent of usage unknown

**S**
- Sealant between floor slab and wall, usually in boiler rooms, risers or lift shafts
- Sealant or mastik on windows
- Lifts shafts - asbestos cement panels lining the shaft at the opening of each floor, and asbestos packing around penetrations
- Sealants and mastics in air conditioning ducting joints
- Spackle or plasterboard wall jointing compounds
- Sprayed insulation - acoustic wall and ceiling
- Sprayed insulation - beams and ceiling slabs
- Stoves - old domestic type; wall insulation

**T**
- Tape and rope - lagging and jointing
- Tapered ends of pipe lagging, where lagging is not necessarily asbestos
- Tilux sheeting in place of ceramic tiles in bathrooms
- Trailing cable under lift cabins
Trains - Harris cars - sprayed asbestos between steel shell and laminex

Trains - country - guards vans - millboard between heater and wall

V

Valve, pump, etc. insulation

W

Welding rods

Woven asbestos cable sheath
Appendix C: Groundwater Exceedance Criteria
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<th>DER 2014 Fresh Waters (mg/L)³</th>
<th>WHO, 2008 (mg/L)⁴</th>
<th>Stockwater (mg/L)⁵</th>
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1: DER 2014 Non-potable use guidelines (NPUG) which are derived from DoH 2014 guidelines.
3: DER 2014 Fresh Waters these investigation levels are based on and are equivalent to the ANZECC 2000 95% Fresh Water guidelines.
4: World Health Organisation Petroleum Products in Drinking Water (multiplied by a factor of 10 for non-potable setting)

*As un-ionised Cyanide
#As α-xylene