BUNBURY - HARVEY
Regional Council

DRAFT

ENVIRONMENTAL MANAGEMENT PLAN

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1. INTRODUCTION

1.1 Background

Bunbury-Harvey Regional Council (BHRC) was established in 1990 as a waste management authority to manage the municipal waste generated from both the City of Bunbury and the Shire of Harvey and operate on behalf of the two councils, the Stanley Road Waste Management Facility (SRWMF). The facility includes a Class II landfill and various recycling facilities which services both domestic and commercial customers.

As a prescribed premise, the facility is required to hold an Environment Protection Licence under Part V of the Environmental Protection Act 1986 and is managed in accordance with the operating licences issued by the Department of Water and Environmental Regulations (DWER).

SRWMF is located on the Swan Coastal Plain, approx. 20 km northeast of Bunbury and 7 km northeast of Australind in the Shire of Harvey. The site was previously used as a sand-mine and is located within the Kemerton Industrial Park bushland buffer zone, however since operations commenced the residential density has increased with the closest receptor located ~800m to the west in Australind.

The site accepts domestic and commercial waste from Bunbury, Australind and surrounds and allows for an annual throughput of 100,000 tonnes. Accepted waste is landfilled on a large mound type landfill and covered with *in situ* sand mined on the site.

New landfilling phases are still awaiting approval notices from the DWER with work continuing in this area. A dedicated closure and rehabilitation plan for the existing landfill has been submitted and the BHRC is fully dedicated to completing this stage in accordance with the Victoria Environmental Protection Agency (EPA) Best Practice Environmental Management – Siting, Design, Operation and Rehabilitation of Landfills (2014) (Best Practice Landfill Guidelines). Work has begun on the installation of a Landfill Gas Monitoring system with Phase 1 of the system due to be commissioned by November 2018 with the final phase completed by 2021 for Phases 2 & 3.

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1.2 Objectives, Scope and Structure

The objective of this Environmental Management Plan is to develop a systematic management approach to the environmental concerns of the BHRC and to comply with ISO 14001 Environmental Management Systems and relevant Department of Water and Environment Regulations legislation.

The expected outcome of this approach is c*ontinual improvement* in environmental management and to ensure that BHRC are managing the impacts and risks associated with the SRWMF to an acceptable standard, while ensuring compliance with the conditions of the environmental licence.

The EMP encompasses environmental management strategies and mitigation measures for all activities conducted on the SRWMF site. The EMP structure includes the following sections:

- Waste management facility description;
- Environmental management system – description of system for facility and linkage to policies;
- Environmental aspects, impacts and risk assessment – description and analysis of impacts and risk associated with the facility operation;
- Environmental management and mitigation – management plans to mitigate the impacts and risks of the facility; and
- Environmental Monitoring – To ensure that operations on site do not cause detrimental environmental impacts.

2. WASTE MANAGEMENT FACILITY

2.1 OVERVIEW

SRWMF is currently licenced to accept the following listed waste for disposal:

- Inert Waste Type 1
- Inert Waste Type 2
- Special Waste Type 1
- Clean Fill
- Contaminated Solid Waste
- Putrescible Waste

The site also accepts the following materials for resource recovery and disposal by contractors to external facilities as required:

- Construction & demolition waste (Re-used onsite)
- Greenwaste
- Metal (Ferrous and non-ferrous)
- Electronic Waste
- Cardboard
- Mattresses and Couches
- Household Hazardous Waste
- Tyres
- Used Motor Oil
- Empty domestic gas bottles

BHRC also has a re-use/recycle Trash and Treasure store.

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2.2 Waste Facility Operations

Domestic Users

Domestic users do not have access the landfill but only have access to the transfer station. Domestic users are permitted to dispose of the following waste types at the transfer station:

- General waste
- Metals
- Cardboard
- Plastic
- Greenwaste
- Waste oil
- Empty gas bottles
- Domestic paint
- Fluorescent light tubes
- Batteries
- Household Hazardous Waste

Commercial Users

All commercial users must pass through the weighbridge operated by BHRC to determine waste disposal category and complete payment. Liquid waste is not accepted at the SRWMF. Commercial users are permitted to dispose of the following waste types:

- General Waste
- Putrescible waste
- Construction and demolition waste
- Quarantined waste
- Greenwaste
- Pre-approved listed wastes (dictated by the DWER Licence) to approved disposal areas

Waste identified at the weighbridge as recyclable is then stored separately to landfill and disposed of by contractors to external facilities as required.

Small commercial vehicles may be directed to the transfer station at the discretion of the weighbridge operator otherwise commercial users must dispose at the appropriate landfill disposal area as directed.

3. Environmental Management Systems

3.1 Environmental Policy

BHRC is committed to the prevention of pollution and will limit, to the lowest practicable level, the negative environmental impact of its business activities through the promotion of resource conservation, waste reduction and the pursuance of material reuse, recycling and recovery prior to the application of other waste management practices. BHRC will undertake its operations in an environmentally responsible way and take all steps possible to prevent any contamination from entering the groundwater.

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BHRC is committed to:

- Identifying environmental objectives and targets and ways to achieve them
- Document environmental management systems through policies and procedures
- Establish operational controls
- Monitor and measure environmental compliance
- Minimise the impact on the environment
- Conserve natural resources and minimise energy consumption and waste

BHRC is committed to environmental sustainability and understands that our actions are important to our staff, customers, visitors as well as our business outcomes and will ensure that its environmental policy, operational procedures and maintenance methods are understood, implemented and maintained by staff, contractors and subcontractors at all levels involved with the operations.

3.2 Organisational Commitment

The BHRC is committed to the protection of the environment by ensuring all activities undertaken at the SRWMF are fully compliant with the conditions of its Environmental Protection Licence and other relevant legal and community obligations.

3.3 Organisational Roles and Responsibilities

The Chief Executive officer (CEO) of the BHRC recognises that it is their responsibility to manage the environmental impacts of our activities and services.

- Supervisor
    - Provide management direction to all operators in regards to SRWMF to ensure compliance with the DWER licencing conditions;
    - Provide updates of the EMP;
- Team Leader
    - Provide guidance and support on matters relating to SRWMF;
    - Conducting site inspections and assisting with audits where required.
- Gate House
    - Directs users to the appropriate disposal point;

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    - Provide guidance and support on matters relating to SRWMF in the absence of the Team Leader;
    - Conducting site inspections and assisting with audits where required in the absence of the Team Leader.
- Occupational Safety and Health Advisor / Compliance Officer
    - Undertake reviews and updates of the EMP;
    - Provide guidance and support to the CEO on matters relating to the EMP;
    - Ensuring site compliance with the requirements of this EMP;
    - Preparing internal and external reports on environmental performance of SRWMF;
    - Issuing corrective and preventative actions and monitoring status;
    - Ensuring subcontractors fulfil their environmental obligations;
    - Liaising with regulatory authorities and other external stakeholders.
- All Employees
    - Take all reasonable measures to protect the environment and prevent harm;
    - Report any environmental incidents or issues observed on-site.

3.4 Legal and Contractual Requirements

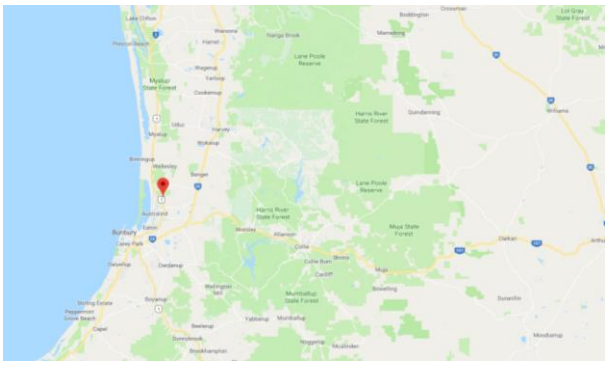
The legislation applicable to the operation of SRWMF includes but is not limited to:

- Environmental Protection Act and Regulations including;
    - Clearing of Native Vegetation
    - Controlled Waste
    - Noise Protection
    - Unauthorised Discharge
- Contaminated Sites Act
- Waste Avoidance and Resource Recovery Act and Regulations
- Freedom of Information
- Local Government Act and Regulations including:
    - Compliance Framework
    - Financial Management
    - Functions and General
- Occupational Safety and Health Act and Regulations

All works undertaken at the SRWMF will be planned, resourced and implemented in accordance with all relevant legal and regulatory requirements.

3.5 Environmental Approvals and Process

The SRWMF (Lot 45 Stanley Road, WELLESLEY WA 6233) is operated by the BHRC.



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As an operational landfill, it is required to hold an Environmental Protection Licence under Part V of the Environmental Protection Act. The licence regulates the operations of the landfill, transfer station, leachate ponds and landfill gas and outlines a number of conditions the SRWMF must meet in order to remain compliant.

This licence also serves the purpose of declaring the listed waste that the SRWMF can accept, as required under the Environmental Protection Regulations, requiring the activity of collecting, transporting, storing, recycling, treating or disposing of listed waste and operating facilities associated with the activities to be licenced.

Any future proposed works associated with the landfill or management of listed wastes will require an amendment to the current licencing agreement. Any works not covered by the current licence shall not be undertaken without gaining approval from the Department of Water and Environmental Regulations.

3.6 Contractor Obligations

Contractors responsible for the duties carried out at the SRWMF must adhere to all conditions in the licence and the requirements of this EMP along with relevant BHRC policies and procedures.

3.7 Landfill Management Plans

Separate to this EMP, BHRC has prepared the following plans to assist with the planning, operation and monitoring of waste management at SRWMF:

- Various Landfill Management Plans
    - Encompasses current and future stages of lined and unlined waste disposal cells for the disposal of general waste
    - Proposed stage layouts
- Landfill Gas Management Plan
- Post-Closure Management Plan
- Groundwater Monitoring Plan

3.8 Operational Procedures

Operational Management plans form the basis of the operational requirements of SRWMF and include:

- Strategic Community Plan
- Household Hazardous Waste Management
- Injury Management and Return to Work
- Safety Management Plan
- Quality Management Plan

4. ENVIRONMENTAL ASPECTS, IMPACTS AND RISK ASSESSMENT

BHRC recognises that it is important to identify and assess our environmental aspects, impacts and risks. The operational risk assessment is provided at ***Table 1.***

5. ENVIRONMENTAL MANAGEMENT AND MITIGATION

Landfills have served a key role in the management of solid wastes and are likely to continue to be an important component of the waste management system, despite being the least preferred management option based on the waste hierarchy. Modern landfills must therefore be managed so that they do not leave an unacceptable environmental legacy for future generations to address. As long as landfilling remains part of our waste management strategy, best-practice measures must be adopted to ensure that landfills are acceptable to the public.

The following section provides key best practice environmental management guidelines that should be employed to minimise environmental impacts for the unlined landfill cells at the Facility.

5.1 Water

The BHRC will undertake all practical measures to prevent the emission of contaminated waters from the Facility. A Detailed Site Investigation has been undertaken and a Mandatory Site Audit is being conducted currently with any issues to be highlighted. Controls are to be implemented upon completion of the report.

Management of water at the Facility is aimed at:

- Minimising the generation of contaminated water
- Preventing deterioration of water quality standards in local surface waterways and groundwater in the vicinity of the site
- Ensuring that water is available to meet operational requirements.

5.2 Stormwater

Stormwater on a landfill site is water which falls on undisturbed areas of the site, and water which falls outside waste filled areas but over disturbed areas (i.e. cleared or construction, intermediate cover and final landfill cap) and is potentially contaminated with sediments. Poor control of stormwater can have impacts not only on receiving waters downstream of the site (e.g. due to entrained litter, sediment and chemical contaminants), but also on the practicality and cost of site operations. Providing adequate surface water drainage is therefore a critical component of any landfill facility design.

There are three main types of stormwater generated on the site:

- Clean stormwater run-off from undisturbed and rehabilitated / revegetated areas of the site
- Potentially sediment laden stormwater run-off from disturbed areas of the site
- Potentially leachate contaminated stormwater run-off from the active landfilling area.

The fundamental approach the BHRC shall apply to stormwater management is as follows:

- Maintain undisturbed and rehabilitated / revegetated areas as filters for sediment from disturbed sub-catchments
- Minimise disturbed areas on the site
- Maintain all stormwater run-off from disturbed areas as diffuse as possible to minimise sediment loads and maximise the opportunities for the vegetation to strip sediment from the run-off. Any concentration of flow over bare and disturbed areas should be avoided
- Establish and maintain erosion controls (re-vegetation, silt fencing etc.) on disturbed areas as required

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5.3 Leachate

BHRC shall undertake the following actions:

- Directing clean stormwater run-off away from the active landfill area
- Regular compaction and covering of the landfilled waste
- Only operating one active landfill face
- Progressively constructing the final capping across the site.

5.4 Air

Landfill gas (LFG) is a natural by-product of the anaerobic biological decomposition of the organic fraction of solid waste disposed of in putrescible landfills. LFG consists primarily of Methane (CH4) and Carbon Dioxide (CO2), but may contain many other constituents in small quantities. Once the LFG has been generated it often moves through and out of the landfill via the path of least resistance.

BHRC has commenced the installation of the Landfill Gas Management System as per the 1.2 General Conditions of the licence agreement.

In addition to the Landfill Gas Management System, the BHRC will implement the following measures to ensure any risk associated with LFG generation is minimised:

- Facility staff must be trained on the health and safety risks posed by LFG emission and migration
- Where possible, organic matter should be included with soil used for daily cover to facilitate oxidising conditions for the breakdown of CH4

5.5 Odour

The biodegradation of wastes in landfill can result in the formation of offensive odours that have the potential to impact the amenity of surrounding land users. Odour may also be associated with load transport, the tipping face, leachate and LFG.

The BHRC shall ensure that odour emitted from the premises does not unreasonably interfere with the health, welfare, convenience, comfort or amenity of any person who is not on the premises.

The location of the Facility is favourable in regard to odour control as it provides a significant buffer from sensitive surrounding land uses. In accordance with BPEM guidelines, the following management practices and mitigation measures should be implemented to further minimise odour emissions during the operation of the facility:

- The waste types accepted at the site must be controlled in accordance with the waste acceptance procedure
- The size of the working face must be kept as small as possible
- Not depositing waste in standing water
- Depositing wastes in thin layers to optimise compaction
- Waste must be covered on a daily basis
- Odorous waste must be covered as soon as practicable upon receipt
- Minimising disturbance of previously filled areas.

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5.6 Dust

Dust generation from any waste facility can be a large issue as most internal roads are temporary so therefore note sealed. BHRC will take all practicable measures to minimise dust emissions arising from the operations of the facility and will include:.

- All trucks entering and leaving the site must be covered to prevent windblown emissions
- Immediate burial and covering of dusty loads
- Entrance and site access roads to be well maintained
- Speed limits to be enforced
- Where practical, earthworks to be undertaken on days with little or no wind
- Use of the truck mounted 10,000ltr water tank and dust suppression equipment for dust suppression twice daily in dry conditions
- The final surface of the landfill will be sealed with a landfill capping system
- Areas of existing vegetation will be maintained and cleared areas that are no longer of operational use will be progressively rehabilitated

5.7 Litter

A hierarchy of litter control measures is used on site as below.

Load Control:

- Site users subject to load and waste acceptance controls that require all normal loads to be secured to prevent the accumulation of litter along principal site access routes
- Regular inspections of incoming vehicles to ensure loads are covered, secure and not contributing to litter
- Regular inspections of primary access routes with active litter clean up as required.

Waste Handling:

Most of the litter arising from landfill sites results from wind acting on the waste at the point of tipping and during the initial compaction practices. Litter loss at the point of tipping will be minimised where practicable by:

- Assessing the waste type being handled
- Not tipping loose waste into the wind
- Using heavier waste to hold down loose waste
- Keeping the working area as tight as practicable.

Portable Litter Screens:

- Portable litter screens to be utilised down-wind and as close to the tipping face as possible
- Screens to be cleared frequently to prevent them from becoming overloaded and potentially being blown over
- Screens to be relocated with changes in the wind direction and tipping face.

Perimeter Fencing:

- Site perimeter fencing shall be maintained in compliance with licence condition 1.3.6
- Litter collections shall be undertaken around the perimeter fence
- Vegetation must be maintained so that it does not grow up the fence and ensnare litter.

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5.8 Vectors

Potential disease vectors at a landfill can include rats and other rodents, foxes, feral cats, insects, birds and other animals, each of which can carry disease and be a threat to public health. Each type of vector can live and multiply at a landfill, and is potentially of concern to site operators, regulators, public health professionals, and the general public.

BHRC engages an accredited vermin control contractor to operate a Feral Animal Control Program on site and based on the results of their activities the site has a minimal number of cats, foxes and rodents. However, birds (e.g. Gulls, Ibis and Emus) have been experienced at the site in significant numbers.

5.9 Noise

The BHRC takes all reasonable and practical measures to prevent or minimise the discharge of noise emissions from the all operations at the facility. The following measures will be undertaken to ensure that noise emissions from the facility are minimised in order to protect the amenity of nearby residents and other land users:

- Machinery operation and transport movements are scheduled to occur during standard business hours
- All mobile plant used onsite must be regularly maintained
- Speed limits must be enforced on all site access roads
- A Complaints Register must be maintained onsite to record any complaints received; this register should include the date, nature and resolution action of any complaints received
- Following complaints, the source of any excessive noise must be identified and work practices modified or re-scheduled to reduce or eliminate the risk of future impacts.

The objective is to protect the amenity of nearby residents and other land users from noise impacts resulting from activities associated with the landfill activities by ensuring that noise levels comply with the Environmental Protection (Noise) Regulations 1997. The BHRC will implement such measures as are necessary to satisfy all requirements relating to noise pollution.

6. ENVIRONMENTAL MONITORING

To ensure operation of the facility is not causing detrimental environmental impacts, the BHRC will undertake regular monitoring of landfill gas, groundwater, stormwater and leachate.

The following sections detail the monitoring to be performed for the various environmental impacts.

6.1 Groundwater

All sampling will be carried out by suitably qualified and experienced personnel, in accordance with *Australian Standard 5667.1-Water quality sampling* (1998). All monitoring samples will be analysed by a laboratory accredited by the National Association of Testing Authorities (NATA).

The facility operating licence requires the BHRC to maintain the groundwater monitoring bores shown in below**.** These bores will be sampled and analysed in accordance with the licence conditions 2.3.

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6.2 Leachate

Leachate management infrastructure will be visually inspected on a regular basis and following significant rainfall events to ensure that it is operating as intended.

The BHRC will promptly undertake actions to remedy any issues identified through the inspections.

6.3 Stormwater

Stormwater management infrastructure will be visually inspected on a weekly basis and following significant rainfall events to ensure that it is operating as intended. This shall include:

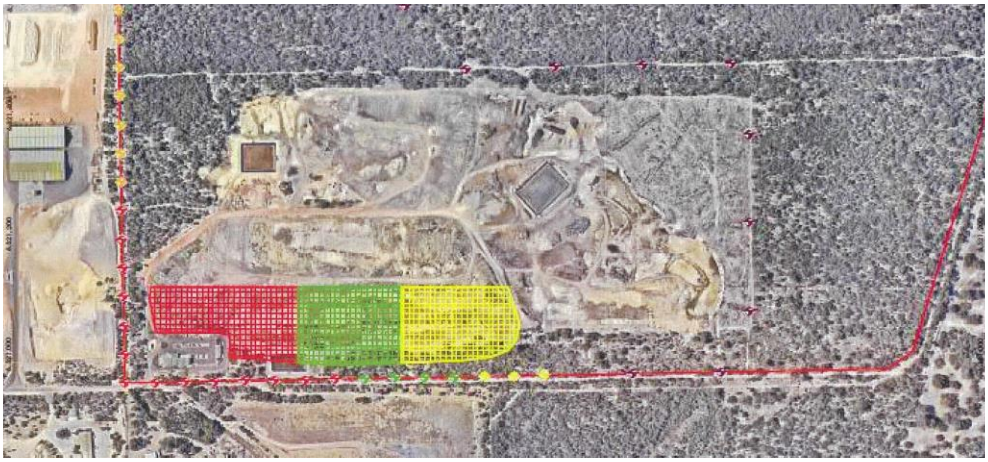
- Checking that stormwater swales and pipes are free of obstructions
- Inspecting bunds and swales for signs of erosion
- Inspecting the capacity of stormwater dams.

The BHRC will promptly undertake actions to remedy any issues identified through the inspections.

6.4 Landfill Gas

LFG monitoring must be completed at the facility to provide assurance that excessive LFG migration and/or emissions are not occurring.

The BHRC will maintain the LFG monitoring points shown below and monitoring will occur in accordance with licencing conditions.



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6.5 Complaints

The BHRC will manage any complaints in line with the licence condition 3.1.3. Complaint records will be managed in accordance with the BHRC Complaints Management Policy.

Any complaints received over the course of a reporting year will be reported to the DWER as part of the Annual Environmental Report.

All complaints received over the course of a reporting year will be reported to DWER as a component of the

6.6 Record Keeping

The details of all monitoring activities outlined above will be recorded and retained in accordance with the DWER Licence and the BHRC Record Keeping Plan.

7. TRAINING, AWARENESS AND COMPETENCE

7.1 Environmental Inductions

All personnel, subcontractors and consultants will be required to undertake a site induction which will, at a minimum, address the following environmental topics:

- Details of the DWER licence and conditions and consequences of non-compliance with the licence;
- The significant environmental risks and details of the EMP;
- Location of significant environmental sensitive areas; and
- Incident management procedures (e.g. the action to be taken in emergencies, communication lines and contact details for emergency services and site representatives).

8. EMERGENCY MANAGEMENT

8.1 Planning and Procedures

The BHRC Emergency Plan for the SRWMF outlines the procedures and responsibilities in preparation for and response to a disaster. Disaster events assessed in the plan include:

- Fire or explosion in the building
- Fire in landfill
- Fire in haulage vehicle
- Grass / scrub fire
- Civil Disturbance
- Landfill gas
- Building structural damage
- Structural fault
- Chemical spill
- Bomb Threat
- Medical (including Stings and Bites)
- Natural Disaster

The Emergency Plan is a live document and is subject to annual reviews and updates.

Contractors to site will ensure that there are appropriately trained First Aid responders on-site.

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8.2 Emergency Response

In the event of an emergency impacting the safety and wellbeing at SRWMF, each Emergency Response Plan shall be adhered to.

Appropriate type and quantity of spill response material shall be maintained on-site at all times in order to respond to a major environmental incident. Adequate Personal Protective Equipment shall be available in the transfer station at all times.

All emergency equipment will be maintained in good working order and checked by independent contractors with exception of the Emergency Shower and Eye wash Station which is checked by staff via the monthly Housekeeping Audit.

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OPERATIONAL RISK ASSESSMENT TABLE 1

SOURCE	RECEPTOR	PATHWAY	PATHWAY DESCRIPTION	RISK DESCRIPTION	RISK	CONTROL
Landfill gas – explosive and asphyxiate gases	Site users - workers	Air	Landfill gas migration via direct venting into the atmosphere.	Asphyxiation & explosion caused by the landfill gas.	LOW	Landfill gas is dispersed & oxidised quickly so the likelihood for risk occurring is rare. The use of a LFG collection & flaring system will further minimise the risk. Landfill Gas Management to be commissioned and monitored as per licence condition 2.3.3.
Landfill gas - odour	Site users - workers	Air	Landfill gas migration via direct venting into the atmosphere.	Nuisance caused by the odour.	LOW	It is likely that odour will be detected near the landfill surface, especially within close proximity to the fresh waste. Landfill Gas Management to be commissioned and monitored as per licence condition 2.3.3.
Landfill leachate	Site users - workers	Air	Ponded landfill leachate is volatilised into the atmosphere & travelling through the air.	Nuisance caused by the odour.	LOW	Due to the relatively mild climate within the area it is unlikely that ponded landfill leachate will remain for a long period of time & is causing odour nuisance. Monitoring of ambient groundwater as per licence condition 2.3.1 & 2.3.2.
		Surface	Leachate migration via surface water runoff.	Ponding of leachate on top or adjacent to landfill. Accidental ingestion & dermal contact.	MODERATE	Following a heavy rainfall, it is possible, though highly unlikely, that leachate will pond within a landfill posing a risk to site workers.
		Sub-surface	Leachate migration via groundwater & extraction via a production bore.	Contaminated groundwater extracted via production bore for non-potable uses. Accidental ingestion & dermal contact.	LOW	Groundwater extracted for dust suppression purposes. The concentrations of contaminants in groundwater unlikely to pose risk to human health.
	Sand Mine - public & workers	Air	Ponded landfill leachate is volatilised into the atmosphere & travelling through the air.	Nuisance caused by the odour.	LOW	Due to the relatively mild climate within the area it is unlikely that ponded landfill leachate will remain for a long period of time & is causing odour nuisance.
	Sand extraction & Class 1 landfill – public & workers	Air	Ponded landfill leachate is volatilised into the atmosphere & travelling through the air.	Nuisance caused by the odour.	LOW	Due to the relatively mild climate within the area it is unlikely that ponded landfill leachate will remain for a long period of time & is causing odour nuisance.
	Residential area - residents	Subsurface	Leachate migration via groundwater & extraction via a production bore	Contaminated groundwater is extracted for non-potable uses.	MODERATE	A total of 17 registered domestic groundwater bores are located within 1 km of the site. Groundwater is monitored as per licence conditions 2.3.1 & 2.3.2. Mandatory Site Audit is being conducted, controls to be highlighted and implemented upon completion of the report.
	Offsite Ecological receptors – Wellesley & Brunswick River	Surface	Leachate migration via surface water runoff.	Contaminated surface water run-off impacting the ecological receptors.	LOW	The closest receptor is located approximately 500 m from the site. It is unlikely that surface water run-off will have an impact on these receptors.
		Subsurface	Vertical migration of leachate within the groundwater	Contaminated groundwater reaching the surface through a river. Direct or indirect consumption of the	MODERATE	Groundwater flow within the deep aquifer is towards the south/south-east in the general direction of the Brunswick & Wellesley Rivers that are likely to be hydraulically connected

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				leachate. Contaminants causing adverse impacts to these receptors & associated ecosystems		with the aquifer. Mandatory Site Audit is being conducted, controls to be highlighted and implemented upon completion of the report.
	Onsite Ecological Receptors: Conservation Category Wetland (CCW)	Surface	Leachate migration via surface water runoff.	Contaminated surface water run-off impacting the ecological receptors.	MODERATE	The CCW is located approximately 300m from the landfill cells. It is possible that surface water run-off may cause adverse impacts to these receptors & associated ecosystems if surface water control infrastructure is compromised during extreme rainfall events, although this has never happened.
		Subsurface	Vertical migration of leachate within the groundwater	Contaminated groundwater reaching the surface through a spring. Direct or indirect consumption of the leachate. Contaminants causing adverse impacts to these receptors & associated ecosystems.	LOW	Groundwater flow within the shallow aquifer is towards the north/north-west. The CCW is likely to be hydraulically connected with the aquifer but the risk of groundwater contamination considered low due to the leachate collection system.
	Onsite Ecological Receptors - Bushland flora/fauna	Surface	Leachate migration via surface water runoff.	Contaminated surface water run-off impacting the ecological receptors.	MODERATE	The site is surrounded by the bushland. It is possible that that surface water run-off may cause adverse impacts to these receptors & associated ecosystems if surface water control infrastructure is compromised during extreme rainfall events.
Dust	Site users - workers	Air	Inert dust blown in the wind.	Nuisance caused by the dust.	LOW	Dust suppression controls in place and appropriate PPE supplied to workers as needed.
	Residential area - residents	Air	Inert dust blown in the wind.	Nuisance caused by the dust.	LOW	It is unlikely that any dust will reach the other surrounding land users. Dust suppression controls in place.
	Sand Mine - workers	Air	Inert dust blown in the wind.	Nuisance caused by the dust.	LOW	It is unlikely that any dust will reach the other surrounding land users. Dust suppression controls in place.
	Sand extraction & Class 1 landfill - workers					
	Pasture & Farmland – residents, workers					
Exposed waste	Site users - workers	Surface	Surface water runoff coming into contact with waste material. Direct physical contact with waste.	Direct or indirect consumption of the leachate. Direct contact with waste material.	MODERATE	The possibility for surface water coming into contact with waste material is relatively high as waste material is exposed in some parts of the landfill as part of the day-to-day operations. Site users coming into direct contact with the waste is unlikely but is controlled by the use of PPE if access is required.

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Litter	Site users - workers	Air	Litter blown in the wind.	Mainly visual impact.	MODERATE	It is almost certain that some littering will occur within the landfill, however, the impact is mainly visual (i.e. minor).
	Residential area - residents				LOW	Due to the long distance, the windblown litter is unlikely to reach the receptor & the impacts are mainly visual (i.e. minor).
	Sand Mine - workers				MODERATE	It is likely that some windblown litter will enter the surrounding land uses, but the impacts are mainly visual (i.e. minor).
	Sand extraction & Class 1 landfill - workers				MODERATE	It is likely that some windblown litter will enter the surrounding land uses, but the impacts are mainly visual (i.e. minor).
	Pasture & Farmland – residents, workers				LOW	Due to the long distance, the windblown litter is unlikely to reach the receptor & the impacts are mainly visual (i.e. minor).
	Bushland – Flora & fauna				MODERATE	It is likely that some windblown litter will enter the surrounding land.

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